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Technical Report

## P-3 SAR CALIBRATION ACTIVITY AT ANDROS ISLAND

D. Sheen

D. Gineris

E. Kasischke

Advanced Concepts Division  
Center for Earth Sciences

FEBRUARY 1991



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## 1.0 INTRODUCTION

From 26 May 1990 through 9 June 1990 the NADC/ERIM P-3/SAR collected calibration data over Andros Island. Several calibration reflectors were deployed on the ground at Andros town. The P-3/SAR typically imaged the reflectors during one pass at the start of each day's flight and one pass at the end of the day. These images were quickly processed to verify focussing and linearity of the SAR. The calibration activity demonstrated that the P-3/SAR was operating properly during the mission and that the data is calibratable.

## 2.0 GROUND TRUTH FOR CALIBRATION ARRAY AT ANDROS ISLAND

A map of Andros town is given in Figure 1. The reflectors were deployed in the water catch area indicated on the figure. Trihedrals were deployed in two configurations: (1) a radiometric array to be observed in stripmap mode and (2) two large reflectors to be observed in spotlight L-band mode.

The radiometric array consisted of triangular trihedral reflectors ranging in size from 45 cm to 90 cm on a side; a map of this array is shown in Figure 2. The reflectors were set on the smooth concrete slabs (level to within 1 degree) which comprised the water catch area. They were then oriented to a precision of  $\pm 0.5$  degree for a radar look direction of  $270^{\circ}$ T. A picture of the water catch area with the trihedrals deployed is presented in Figure 3.

In Figure 4 a map of the spotlight mode reflector array is shown. This array consisted of two large triangular trihedrals (42" long edges) which were deployed for a radar look direction of  $10^{\circ}$ T. They did not interfere with the radiometric array because when viewed from the backside the trihedrals have a very low radar cross section (RCS).

### 3.0 CALIBRATION ANALYSIS

The calibration analysis consisted at two main studies: (1) a detailed image quality and linearity study for one pass and (2) a daily system calibration pass analyses.

#### 3.1 DETAILED IMAGE QUALITY AND LINEARITY STUDY: JUNE 3, 1990

A detailed image quality and system linearity study was done for June 3, 1990 pass #36. In Figures 5, 6, 7, and 8 the X-VV, L-VV, C-VV, and L-HH channel images of the radiometric calibration array at Andros town and some surrounding areas are presented.

The images all appear to be focused and to verify this an impulse response (IPR) analysis of the trihedrals in the radiometric array was performed for each image. In Figure 9, the IPR listing is given for the X-VV channel. In Figures 10, 11, 12, and 13 azimuth and range cuts of the IPR are plotted for the largest and smallest reflectors. This analysis was repeated for the L-VV, C-VV and L-HH imagery and the results are presented in Figures 14 through 28. The image quality was good for all the images and the resolution (as defined by 3 dB widths) was approximately 2m in range and 3m in azimuth. The X- and C-band focused slightly better than L-band.

A system linearity study was also performed for all the images from pass #36 on June 3, 1990. The linearity of the radar system can be examined by comparing the normalized intensity of a reflector to the expected RCS of the reflector. The normalized intensity is the intensity of the reflector integrated over the region of the response greater than one-half the peak intensity and then corrected for the antenna pattern, range falloff, background clutter level, transmitted power, and system attenuator setting. When the normalized intensity of several reflectors in the image is plotted versus the theoretical RCS of the reflectors a linear relationship should be observed. A non-linear relationship would indicate that the system is saturating, the receiver

is non-linear, or the signal is in the noise floor of the system. In Figure 29 a plot of the reflectors theoretical RCS vs. normalized intensity is presented. This plot illustrates that the SAR is operating properly. In Figure 30 a computed list is presented with the reflector data and the results of a least-square linear fit. This fit indicates a slope of 1.019 (close to the ideal of one) and a mean square error from the fitted line of 0.34 dB. This analysis was repeated for L-VV, C-VV, and L-HH and the results are presented in Figure 31 through 36. The system was operating linearly for all the data examined.

### 3.2 DAILY SYSTEM CALIBRATION PASSES

In Tables 1 through 10 each pass over the calibration array at Andros Island is examined. Typically the impulse response listing for a large and small reflector from each channel is presented. This provides a quick check of focusing and linearity on a daily basis. It appears the system operated properly during the mission. From these tables the focusing of the system can be verified by examining the 3 dB widths of the IPR. The linearity of the system can be verified by comparing the relative 3 dB energy of the reflectors to the theoretical RCS of the reflectors and showing the two are linearly proportional.

### 4.0 CONCLUSION

The image quality and linearity measures indicated the P-3 system operated properly during the mission from 26 May 1990 through 9 June 1990.

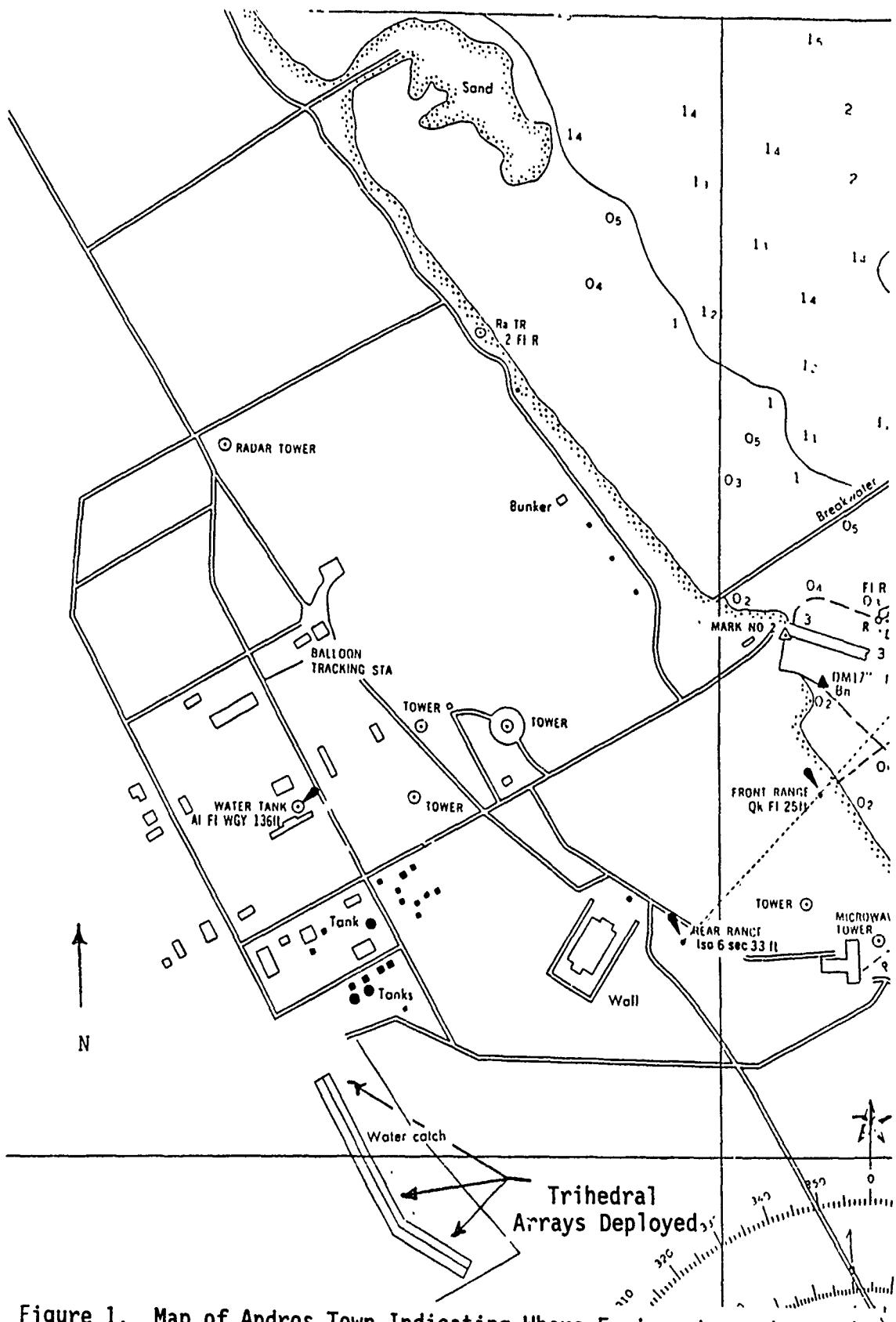


Figure 1. Map of Andros Town Indicating Where Equipment was Located

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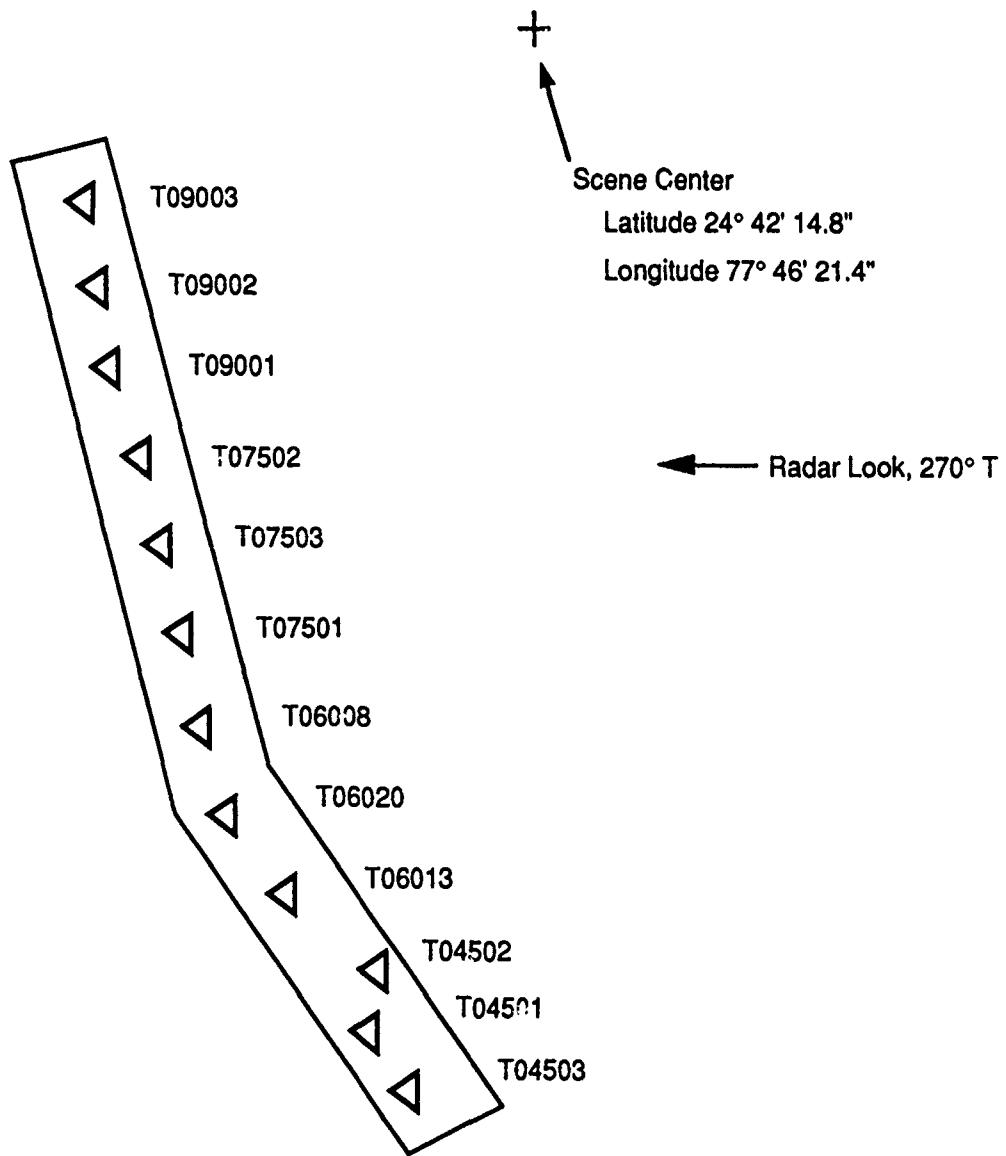


Figure 2. Radiometric Array for Stripmap Passes



Figure 3. Photographs of the Radiometric Array for Stripmap Passes

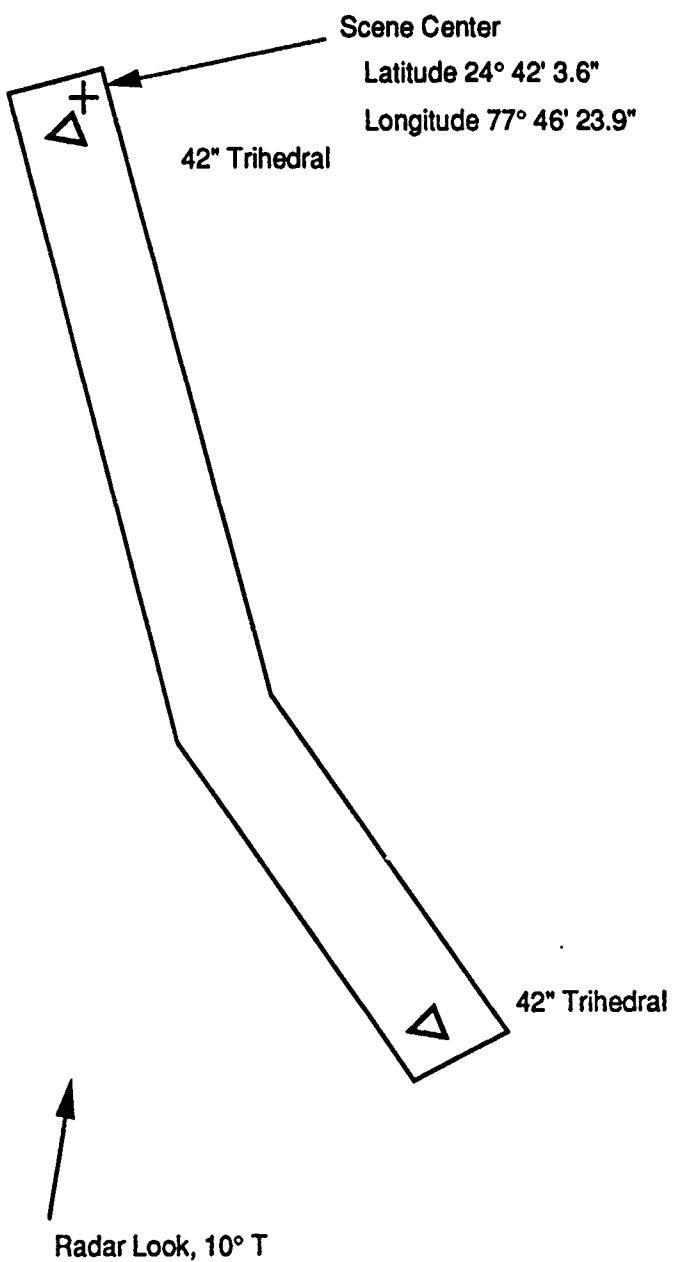


Figure 4. Spotlight Mode Trihedral Array at the Water Catch Area

P3T1003 X-VV  
JAX Calibration Array  
June 3, 1990 Pass 36

Line Length = 2048 Margin = 0 Line Reps = 1 Pixel Width = 1 Text Size = 2 White = 255 b=8 g=8 c=8 7774



Figure 5. JAX Calibration Array X-VV (located at Andros Town)

P3T1004 L-VV  
JAX Calibration Array  
June 3, 1990 Pass 36

Line Length = 2048 Margin = 0 Line Reps = 1 Pixel Width = 1 Text Size = 2 White = 255 b=8 g=8 c=8 7774



Figure 6. JAX Calibration Array L-VV (located at Andros Town)

P3T1005 C-VV  
JAX Calibration Array  
June 3, 1990 Pass 36

Line Length = 2048 Margin = 0 Line Reps = 1 Pixel Width = 1 Text Size = 2 White = 255 b=8 g=8 c=8 7774

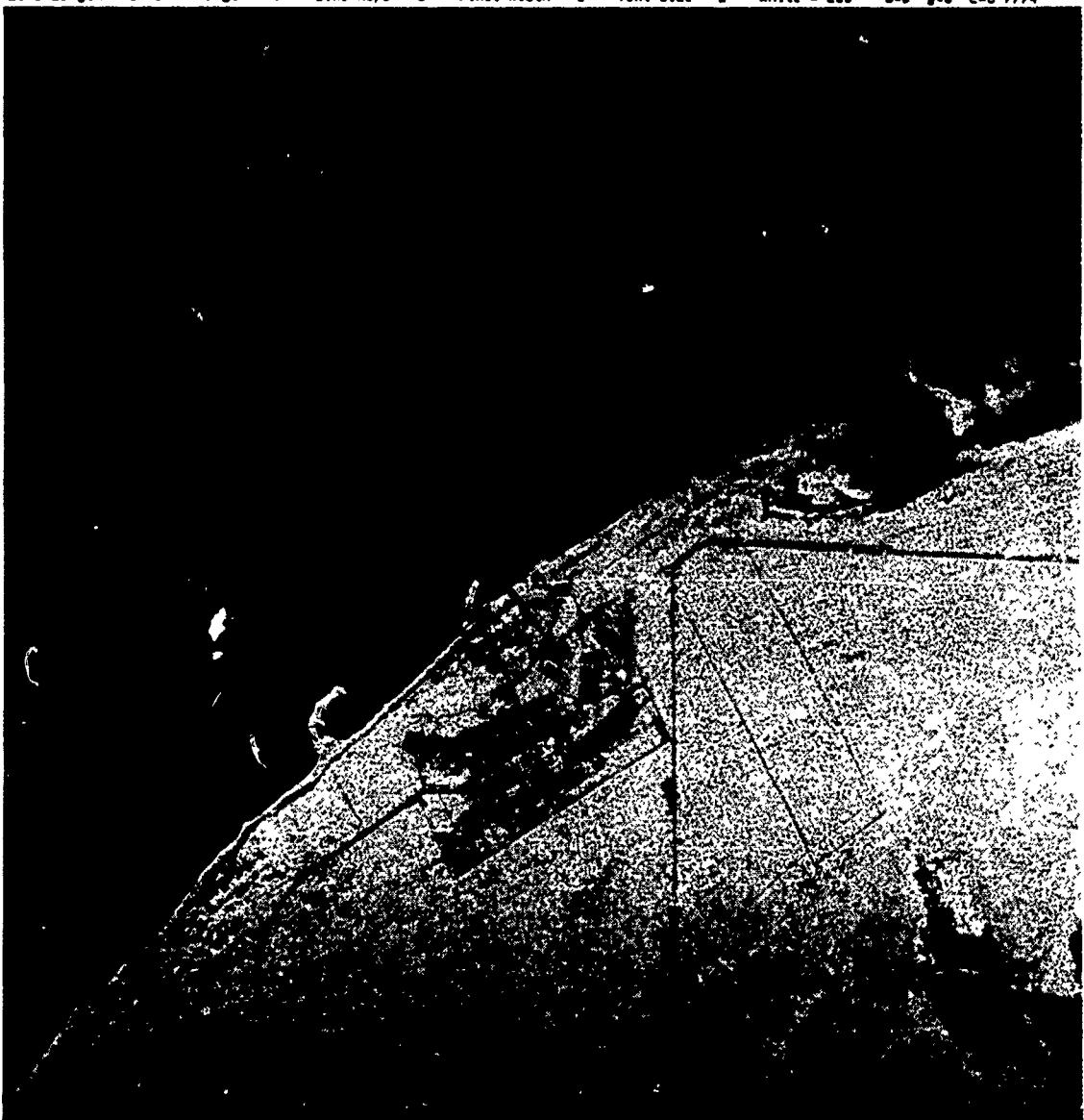


Figure 7. JAX Calibration Array C-VV (located at Andros Town)

P3T1006 L-HH  
JAX Calibration Array  
June 3, 1990 Pass 36

Line Length = 2048 Margin = 0 Line Reps = 1 Pixel Width = 1 Text Size = 2 White = 255 b=0 g=0 c=0 7774

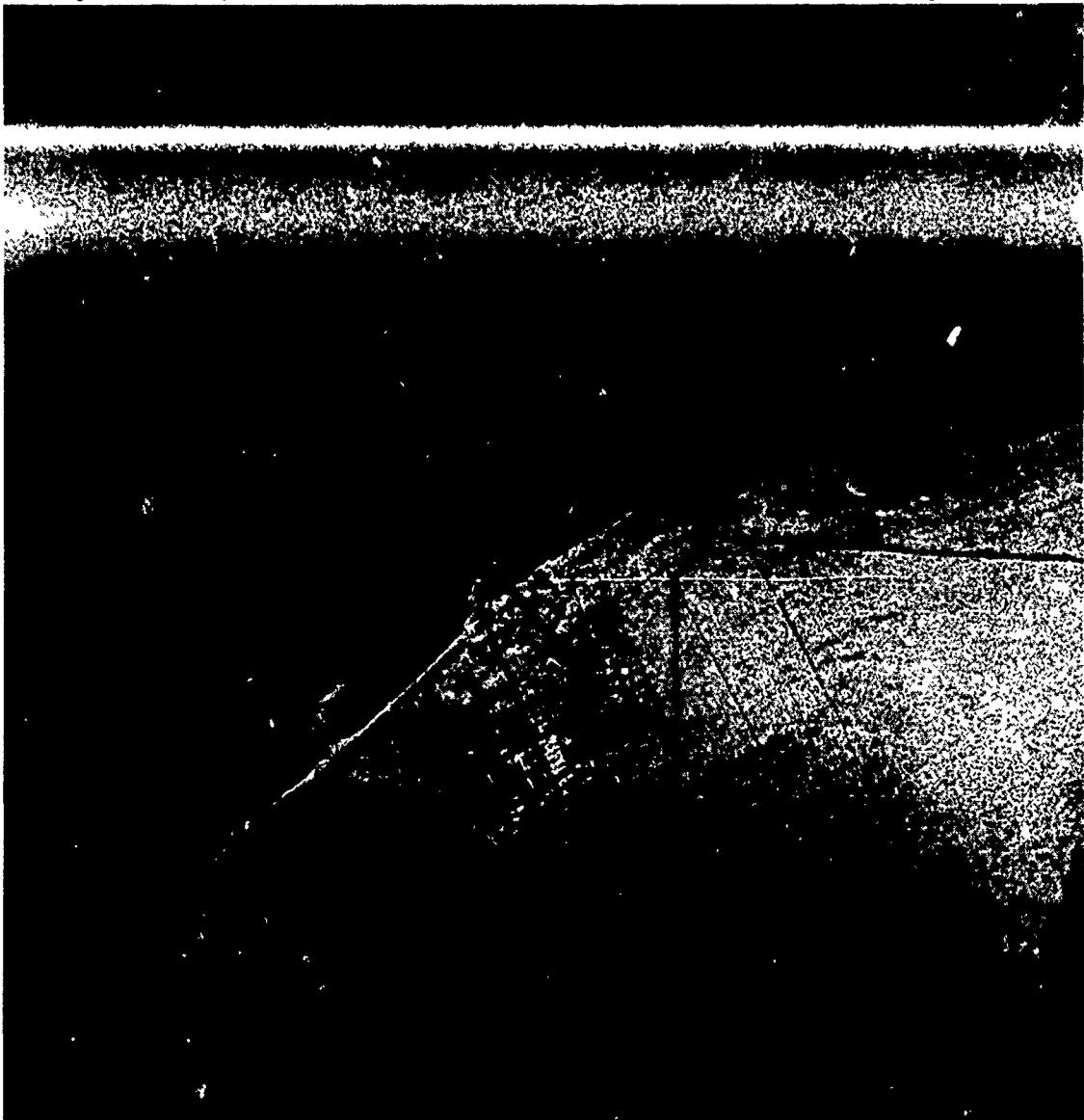


Figure 8. JAX Calibration Array L-HH (located at Andros Town)

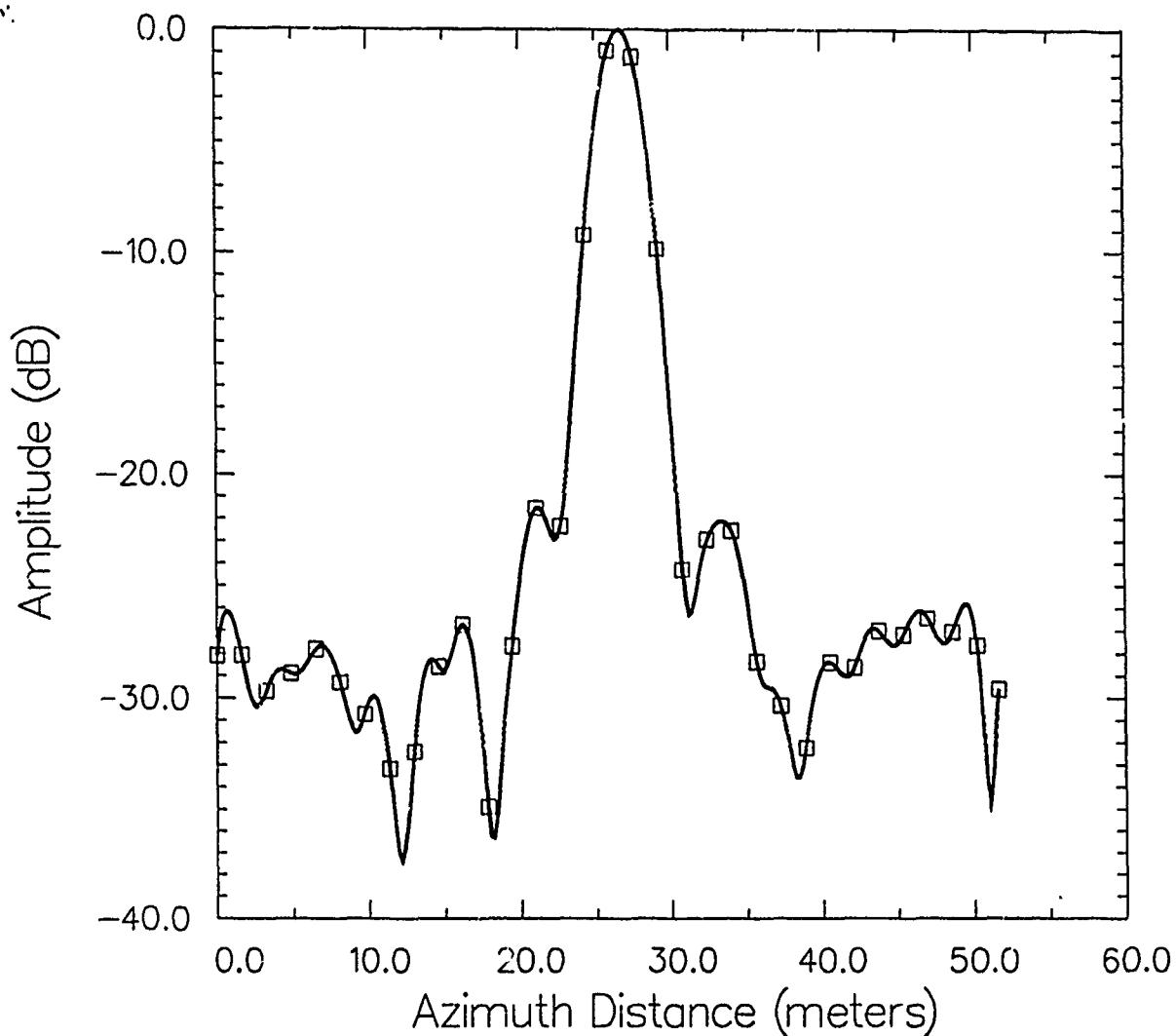
ARIES\$DRA2: [RSL.GINERIS]P3T1003.IPR;1  
 Environmental Research Institute of Michigan  
 Impulse Response Analysis Session Log  
 Executed 22-AUG-90 at 10:23:08.

22-AUG-1990 10:30

Filename	Peak	Rec	Peak	$\Sigma$ In	AzSpa	RgSpa	Az3dB	Rg3dB	Energy3dB	EnerTotal	Peak	Sig/Back	Comment
P3T1003.CI	2716.000	2258.500	1.620	1.200	2.738	1.544	.30969E+09	.58191E+09	.10450.	41.54	90.03		
P3T1003.CI	2702.125	2276.750	1.620	1.200	2.764	1.559	.33142E+09	.62988E+09	.10772.	41.80	90.02		
P3T1003.CI	2684.500	2294.375	1.620	1.200	2.741	1.566	.36541E+09	.69392E+09	.11322.	42.24	90.01		
P3T1003.CI	2674.500	2316.875	1.620	1.200	2.726	1.571	.15551E+09	.31692E+09	.7384.	38.52	75.02		
P3T1003.CI	2665.875	2334.500	1.620	1.200	2.743	1.564	.17114E+09	.41067E+09	.7746.	38.94	75.03		
P3T1003.CI	2656.375	2351.000	1.620	1.200	2.729	1.574	.17387E+09	.59974E+09	.7798.	39.00	75.01		
P3T1003.CI	2640.875	2360.000	1.620	1.200	2.743	1.590	.52438E+08	.40465E+09	.4274.	33.77	60.08		
P3T1003.CI	2629.250	2366.375	1.620	1.200	2.718	1.585	.56343E+08	.33116E+09	.4442.	34.11	60.20		
P3T1003.CI	2621.875	2373.000	1.620	1.200	2.755	1.577	.61591E+08	.28021E+09	.4638.	34.48	60.13		
P3T1003.CI	2616.250	2384.000	1.620	1.200	2.807	1.574	.25339E+08	.23088E+09	.2962.	30.59	45.01		
P3T1003.CI	2601.750	2382.000	1.620	1.200	2.770	1.571	.23645E+08	.10783E+09	.2872.	30.32	45.02		
P3T1003.CI	2588.500	2399.875	1.620	1.200	2.751	1.583	.24353E+08	.66246E+08	.2911.	30.44	45.03		

Figure 9. Impulse Response Listing for X-VW Channel

## Impulse Response, Azimuth

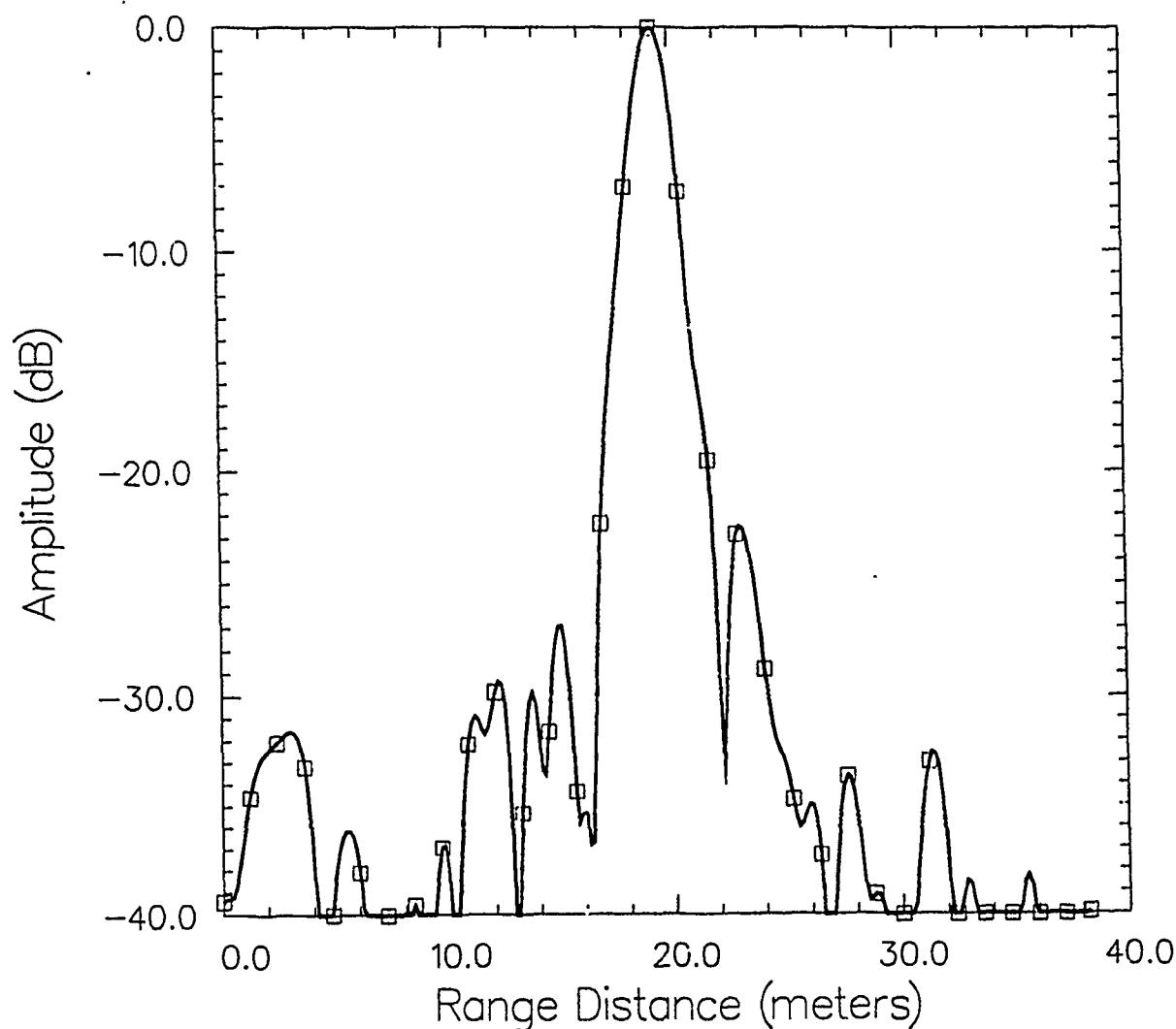


File: P3T1003.CI  
Rec: 2716.0000  
Elem: 2258.5000  
Azimuth 3dB width: 2.738m  
Range 3dB width: 1.544m  
Peak Amplitude: 10449.8  
Signal/Background: 92.48

Azimuth Spacing: 1.62m  
Range Spacing: 1.20m  
2D 3dB Energy:  $3.097 \times 10^8$   
2D Total Energy:  $5.819 \times 10^8$   
Comment: 3JUN90P36L

Figure 10. Impulse Response, Azimuth, X-VV Channel, Large Reflector

## Impulse Response, Range

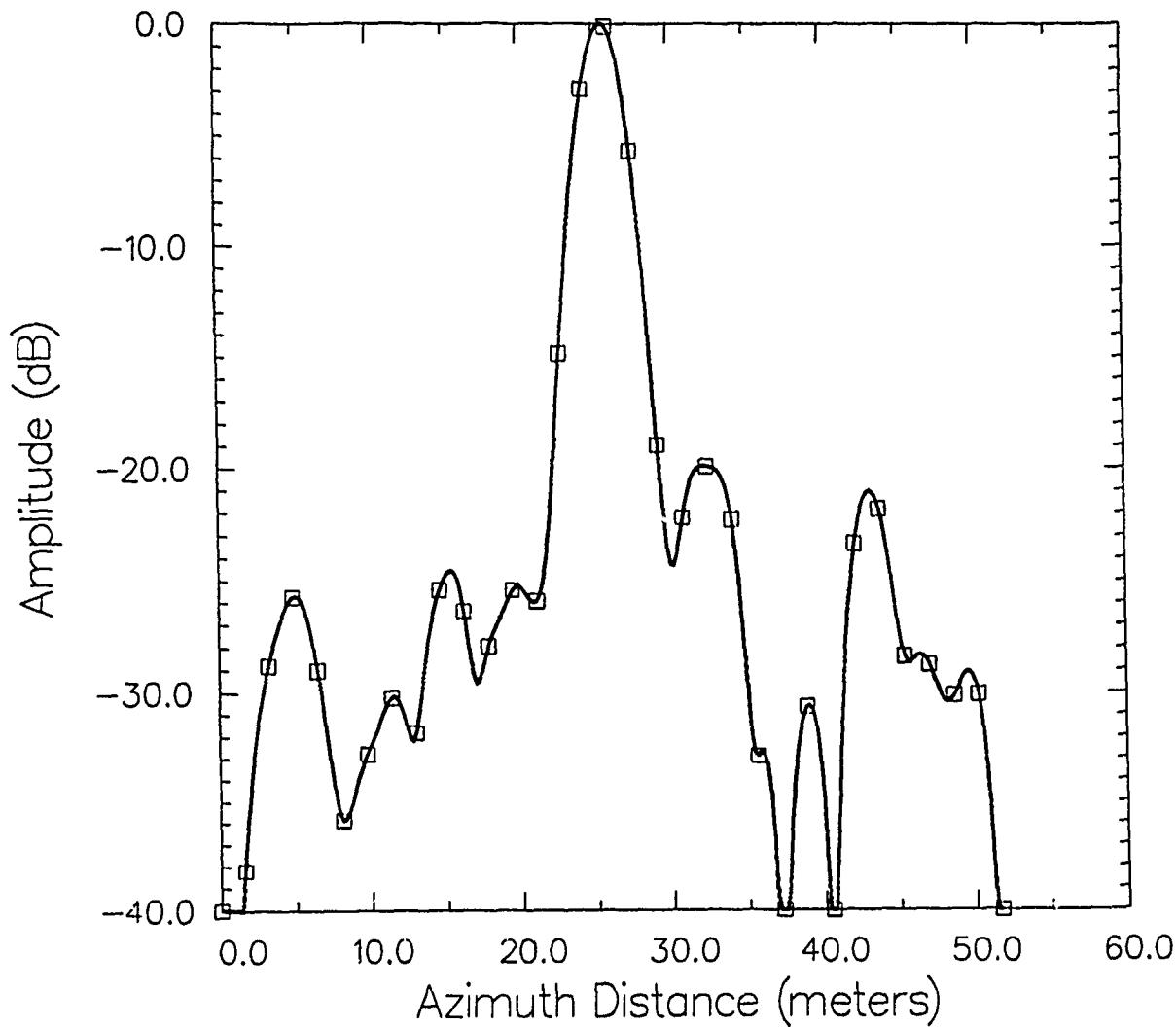


File: P3T1003.CI  
Rec: 2716.0000  
Elem: 2258.5000  
Azimuth 3dB width: 2.738m  
Range 3dB width: 1.544m  
Peak Amplitude: 10449.8  
Signal/Background: 92.48

Azimuth Spacing: 1.62m  
Range Spacing: 1.20m  
2D 3dB Energy:  $3.097 \times 10^8$   
2D Total Energy:  $5.819 \times 10^8$   
Comment: 3JUN90P36L

Figure 11. Impulse Response, Range, X-VV Channel, Large Reflector

## Impulse Response, Azimuth

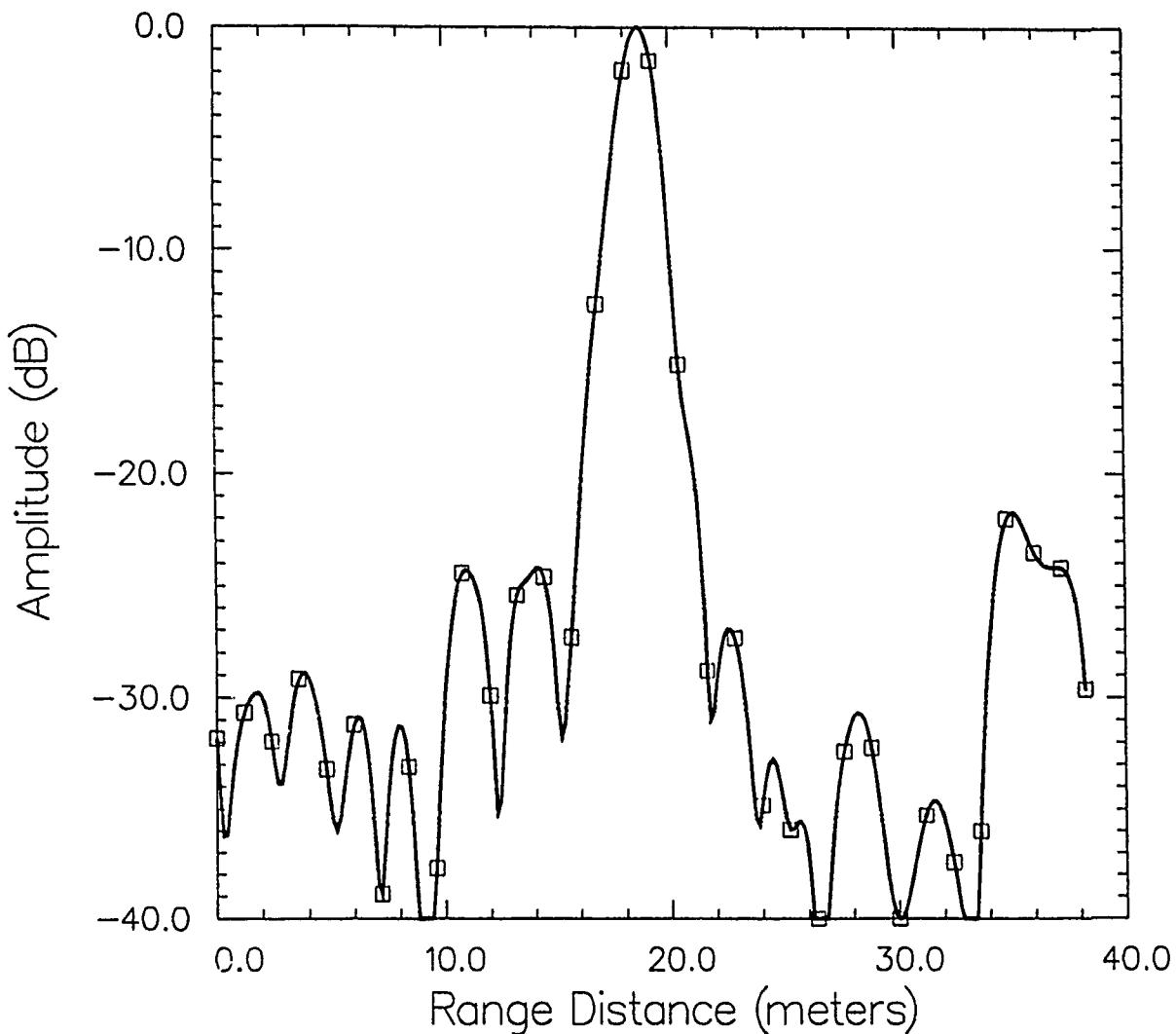


File: P3T1003.CI  
Rec: 2588.5000  
Elem: 2399.8750  
Azimuth 3dB width: 2.751m  
Range 3dB width: 1.583m  
Peak Amplitude: 2911.4  
Signal/Background: 25.76

Azimuth Spacing: 1.62m  
Range Spacing: 1.20m  
2D 3dB Energy:  $2.435 \times 10^7$   
2D Total Energy:  $6.625 \times 10^7$   
Comment: 3JUN90P36S

Figure 12. Impulse Response, Azimuth, X-VV Channel, Small Reflector

## Impulse Response, Range



File: P3T1003.CI  
Rec: 2588.5000  
Elem: 2399.8750  
Azimuth 3dB width: 2.751m  
Range 3dB width: 1.583m  
Peak Amplitude: 2911.4  
Signal/Background: 25.76

Azimuth Spacing: 1.62m  
Range Spacing: 1.20m  
2D 3dB Energy:  $2.435 \times 10^7$   
2D Total Energy:  $6.625 \times 10^7$   
Comment: 3JUN90P36S

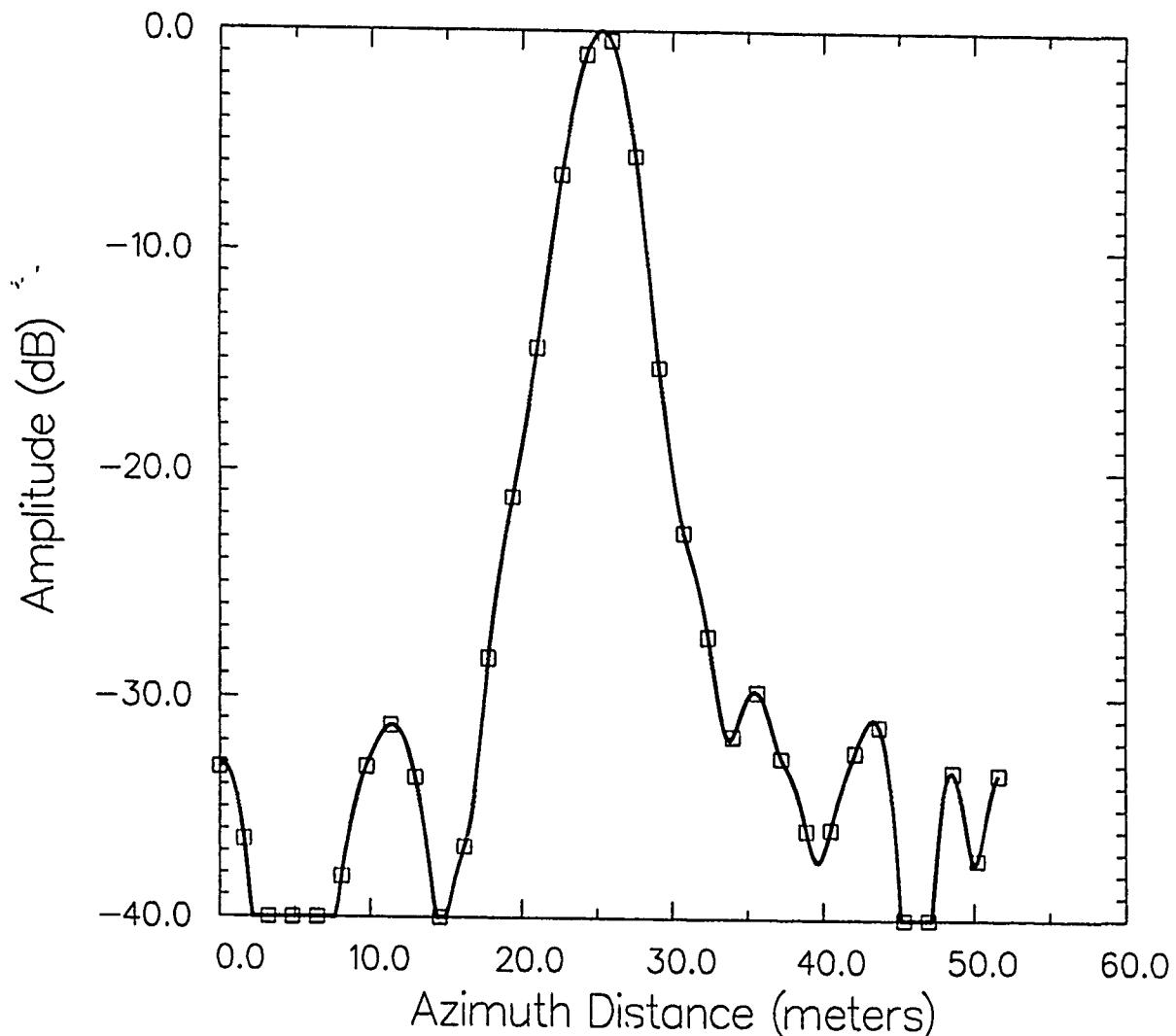
Figure 13. Impulse Response, Range, X-VV Channel, Small Reflector

-ARIES\$DRA2:[RSL.GINERIS]P3T1004.IPR;2  
 Environmental Research Institute of Michigan  
 Impulse Response Analysis Session Log  
 Executed 22-AUG-90 at 10:55:56.

Filename	Peak	Rec	Peak Elm	AzSpa	RgSpa	Az3dB	Rg3dB	Energy3dB	EnerTotal	Peak	Sig/Back	Comment
P3T1004.CI	2713.500	2258.625	1.620	1.200	3.356	1.920	1.7678E+07	.339996E+07	637.	36.64	90.03	
P3T1004.CI	2699.625	2276.875	1.620	1.200	3.475	1.926	.18911E+07	.36820E+07	655.	36.88	90.02	
P3T1004.CI	2682.000	2294.500	1.620	1.200	3.442	1.874	.18052E+07	.34313E+07	646.	36.77	90.01	
P3T1004.CI	2672.000	2316.875	1.620	1.200	3.360	1.926	.66746E+06	.15282E+07	391.	32.40	75.02	
P3T1004.CI	2663.375	2334.625	1.620	1.200	3.342	1.933	.10164E+07	.27890E+07	482.	34.22	75.03	
P3T1004.CI	2654.000	2351.000	1.620	1.200	3.288	1.924	.43134E+07	.43134E+07	542.	35.23	75.01	
P3T1004.CI	2638.375	2360.125	1.620	1.200	3.246	1.928	.47130E+06	.25101E+07	331.	30.94	60.08	
P3T1004.CI	2626.750	2366.500	1.620	1.200	3.268	1.915	.46195E+06	.27456E+07	328.	30.87	60.20	
P3T1004.CI	2619.250	2373.250	1.620	1.200	3.334	1.935	.48109E+06	.20754E+07	332.	30.97	60.20	
P3T1004.CI	2623.875	2409.875	1.620	1.200	4.271	1.928	.18511E+06	.55535E+07	186.	25.96	45.01	
P3T1004.CI	2599.375	2382.250	1.620	1.200	3.253	1.976	.50536.	.55816E+06	108.	21.18	45.02	
P3T1004.CI	2558.500	2401.500	1.620	1.200	3.171	1.967	.12405E+06	.10186E+08	176.	25.46	45.03	

Figure 14. Impulse Response Listing for L-WV Channel

## Impulse Response, Azimuth

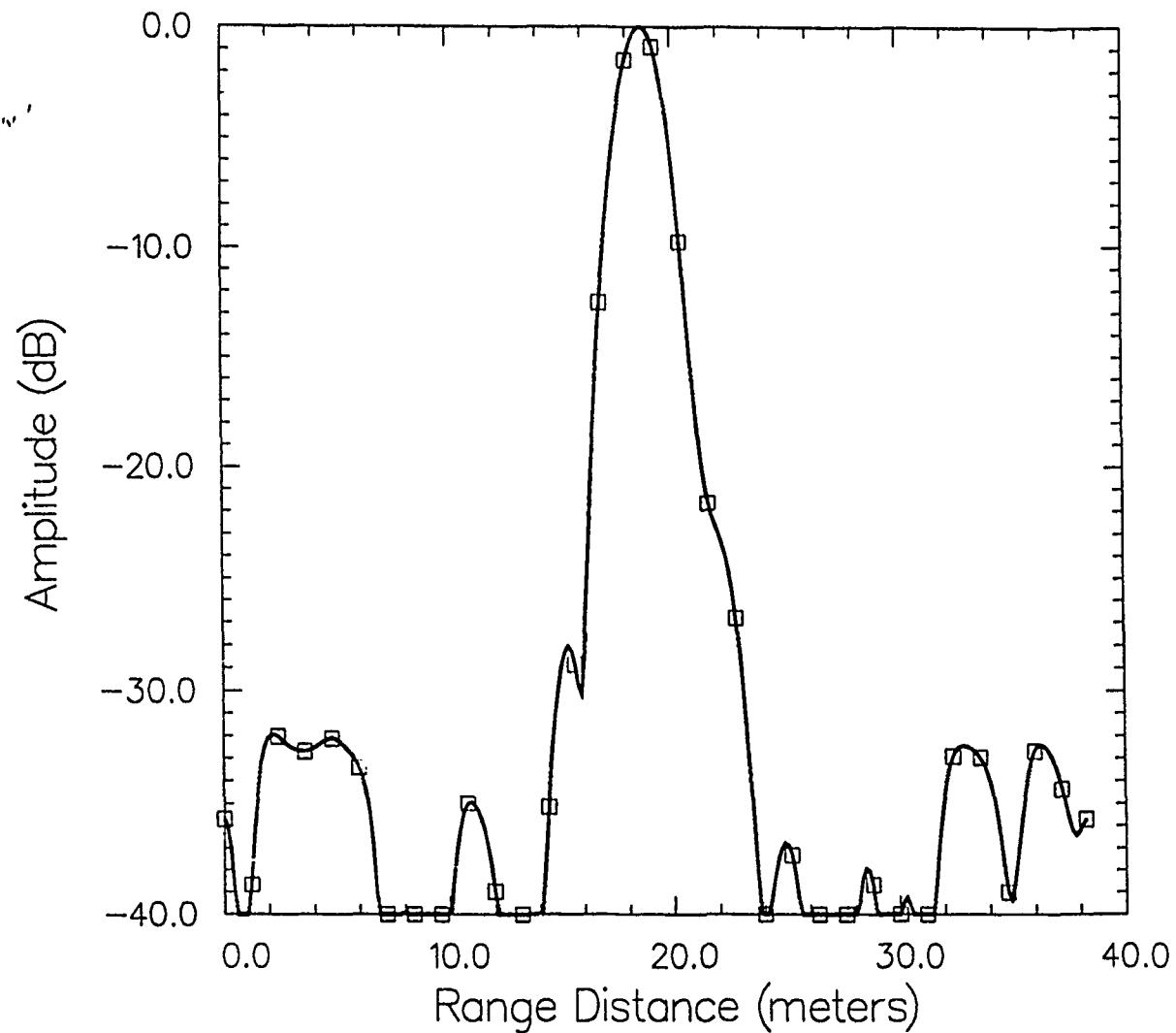


File: P3T1004.Cl  
Rec: 2713.5000  
Elem: 2258.6250  
Azimuth 3dB width: 3.356m  
Range 3dB width: 1.920m  
Peak Amplitude: 637.1  
Signal/Background: 45.50

Azimuth Spacing: 1.62m  
Range Spacing: 1.20m  
2D 3dB Energy:  $1.768 \times 10^6$   
2D Total Energy:  $3.400 \times 10^6$   
Comment: 3JUN90P36L

Figure 15. Impulse Response, Azimuth, L-VV Channel, Large Reflector

## Impulse Response, Range

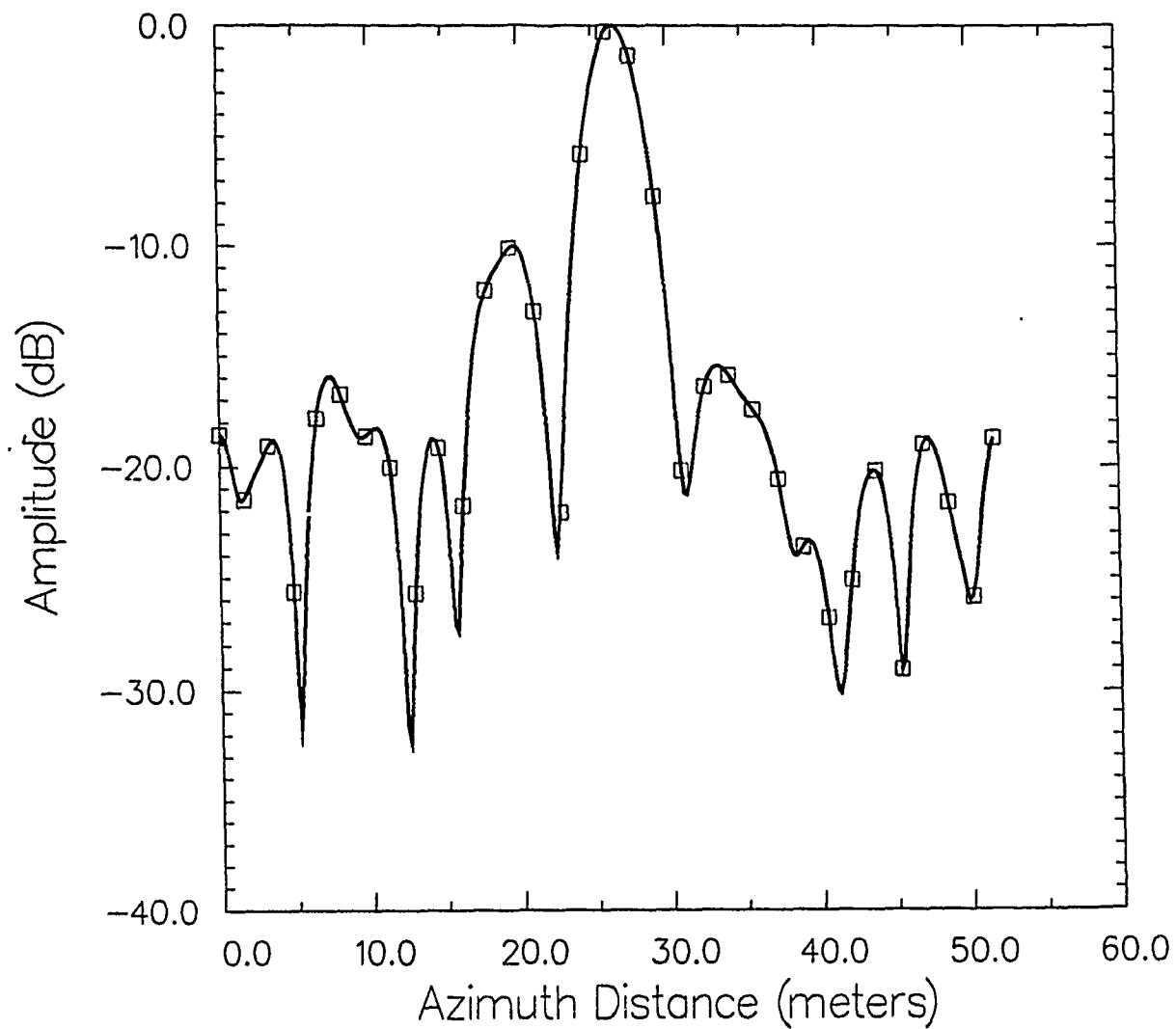


File: P3T1004.CI  
Rec: 2713.5000  
Elem: 2258.6250  
Azimuth 3dB width: 3.356m  
Range 3dB width: 1.920m  
Peak Amplitude: 637.1  
Signal/Background: 45.50

Azimuth Spacing: 1.62m  
Range Spacing: 1.20m  
2D 3dB Energy:  $1.768 \times 10^6$   
2D Total Energy:  $3.400 \times 10^6$   
Comment: 3JUN90P36L

Figure 16. Impulse Response, Range, L-VV Channel, Large Reflector

## Impulse Response, Azimuth

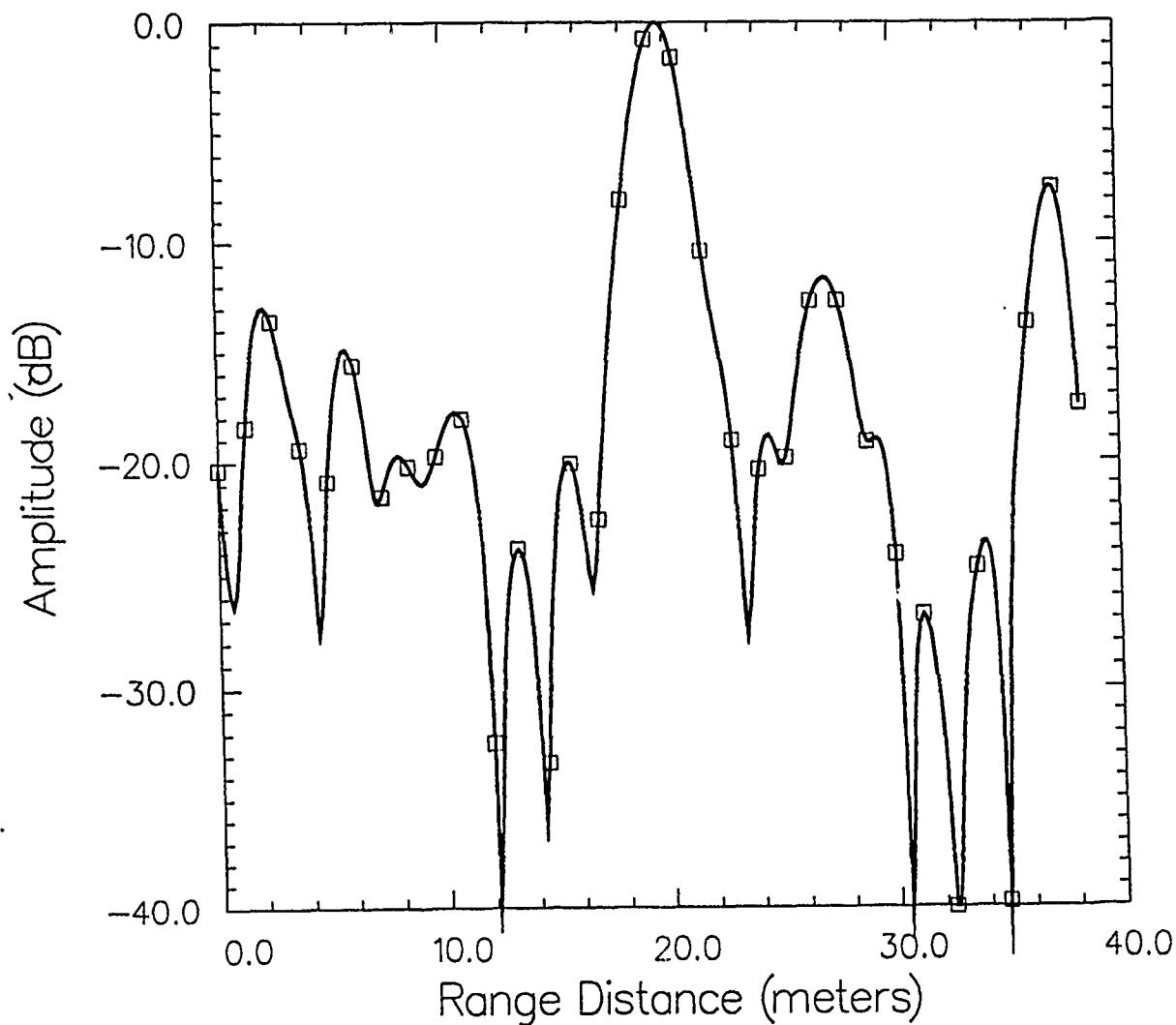


File: P3T1004.CI  
Rec: 2599.3750  
Elem: 2382.2500  
Azimuth 3dB width: 3.253m  
Range 3dB width: 1.976m  
Peak Amplitude: 107.5  
Signal/Background: 7.68

Azimuth Spacing: 1.62m  
Range Spacing: 1.20m  
2D 3dB Energy:  $5.054 \times 10^4$   
2D Total Energy:  $5.582 \times 10^5$   
Comment: 3JUN90P36S

Figure 17. Impulse Response, Azimuth, L-VV Channel, Small Reflector

## Impulse Response, Range



File: P3T1004.CI  
Rec: 2599.3750  
Elem: 2382.2500  
Azimuth 3dB width: 3.253m  
Range 3dB width: 1.976m  
Peak Amplitude: 107.5  
Signal/Background: 7.68

Azimuth Spacing: 1.62m  
Range Spacing: 1.20m  
2D 3dB Energy:  $5.054 \times 10^4$   
2D Total Energy:  $5.582 \times 10^5$   
Comment: 3JUN90P36S

Figure 18. Impulse Response, Range, L-VV Channel, Small Reflector

ARIES4DRA2: [RSI.GINERIS]P3T1005.IPR;1

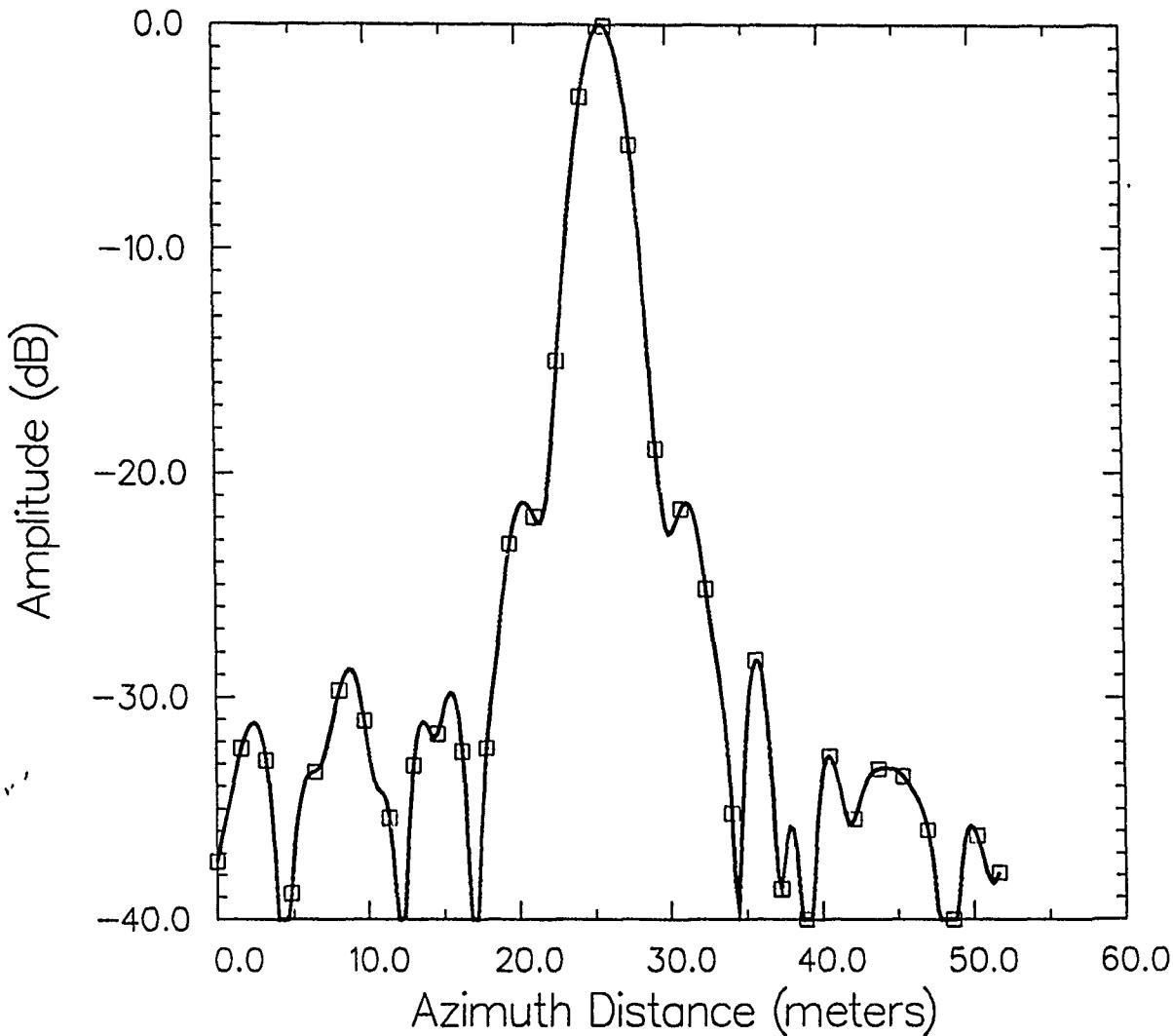
Environmental Research Institute of Michigan  
 Impulse Response Analysis Session Log  
 Executed 22-AUG-90 at 14:54:38.

22-AUG-1990 14:58

Filename	Peak	Rec	Peak Elm	AzSpa	RgSpa	Az3dB	Rg3dB	Energy3dB	EnerTotal	Peak	Sig/Back	Comment
P3T1005.CI	2715.250	2258.875	1.620	1.200	2.744	1.564	1.2456E+09	.22814E+09	6598.	41.09	90.03	
P3T1005.CI	2701.375	2277.125	1.620	1.200	2.797	1.541	1.2822E+09	.23663E+09	6693.	41.22	90.02	
P3T1005.CI	2683.625	2294.875	1.620	1.200	2.781	1.544	1.2844E+09	.23455E+09	6702.	41.23	90.01	
P3T1005.CI	2673.750	2317.250	1.620	1.200	2.770	1.546	5.1424E+08	.10534E+09	4244.	37.26	75.02	
P3T1005.CI	2665.125	2335.000	1.620	1.200	2.723	1.558	6.6849E+08	.14029E+09	4845.	38.41	75.03	
P3T1005.CI	2655.625	2351.375	1.620	1.200	2.784	1.569	6.7932E+08	.24669E+09	4859.	38.44	75.01	
P3T1005.CI	2640.125	2360.375	1.620	1.200	2.737	1.567	1.8624E+08	.12095E+09	2550.	32.84	60.08	
P3T1005.CI	2628.500	2366.875	1.620	1.200	2.709	1.583	1.6519E+08	.10299E+09	2401.	32.31	60.20	
P3T1005.CI	2621.000	2373.500	1.620	1.200	2.750	1.574	1.7047E+08	.85406E+08	2437.	32.44	60.13	
P3T1005.CI	2615.500	2384.375	1.620	1.200	2.801	1.568	.81461E+07	.78998E+08	1681.	29.22	45.01	
P3T1005.CI	2601.000	2382.500	1.620	1.200	2.841	1.543	.85105E+07	.39761E+08	1646.	29.04	45.02	
P3T1005.CI	2587.750	2400.250	1.620	1.200	2.760	1.546	.95928E+07	.35451E+08	1832.	29.96	45.03	

Figure 19. Impulse Response Listing for C-VV Channel

## Impulse Response, Azimuth

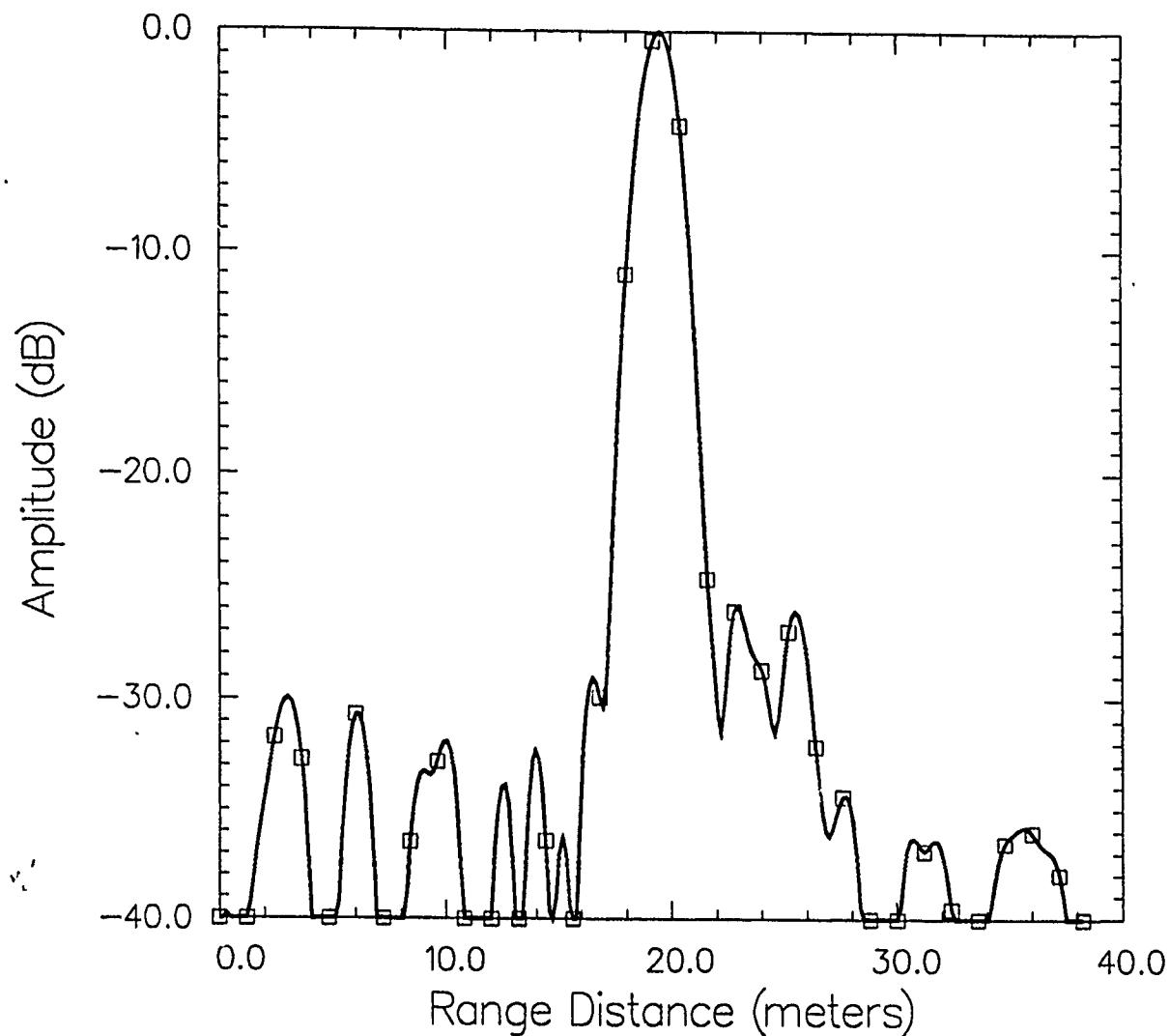


File: P3T1005.CI  
Rec: 2715.2500  
Elem: 2258.8750  
Azimuth 3dB width: 2.744m  
Range 3dB width: 1.564m  
Peak Amplitude: 6598.3  
Signal/Background: .77.17

Azimuth Spacing: 1.62m  
Range Spacing: 1.20m  
2D 3dB Energy:  $1.246 \times 10^8$   
2D Total Energy:  $2.281 \times 10^8$   
Comment: 3JUN90P36L

Figure 20. Impulse Response, Azimuth, C-VV Channel, Large Reflector

## Impulse Response, Range

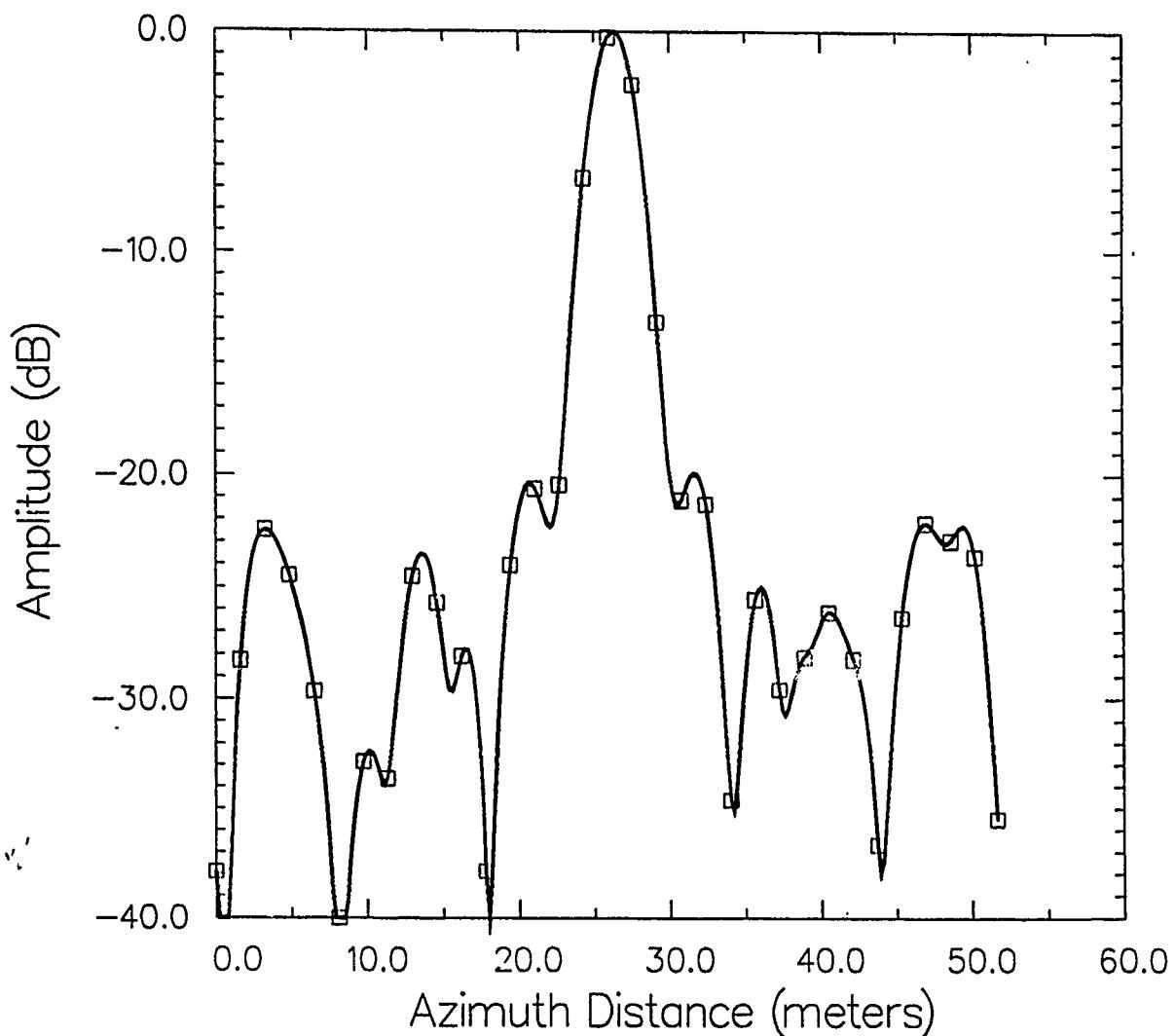


File: P3T1005.CI  
Rec: 2715.2500  
Elem: 2258.8750  
Azimuth 3dB width: 2.744m  
Range 3dB width: 1.564m  
Peak Amplitude: 6598.3  
Signal/Background: 77.17

Azimuth Spacing: 1.62m  
Range Spacing: 1.20m  
2D 3dB Energy:  $1.246 \times 10^8$   
2D Total Energy:  $2.281 \times 10^8$   
Comment: 3JUN90P36L

Figure 21. Impulse Response, Range, C-VV Channel, Large Reflector

## Impulse Response, Azimuth

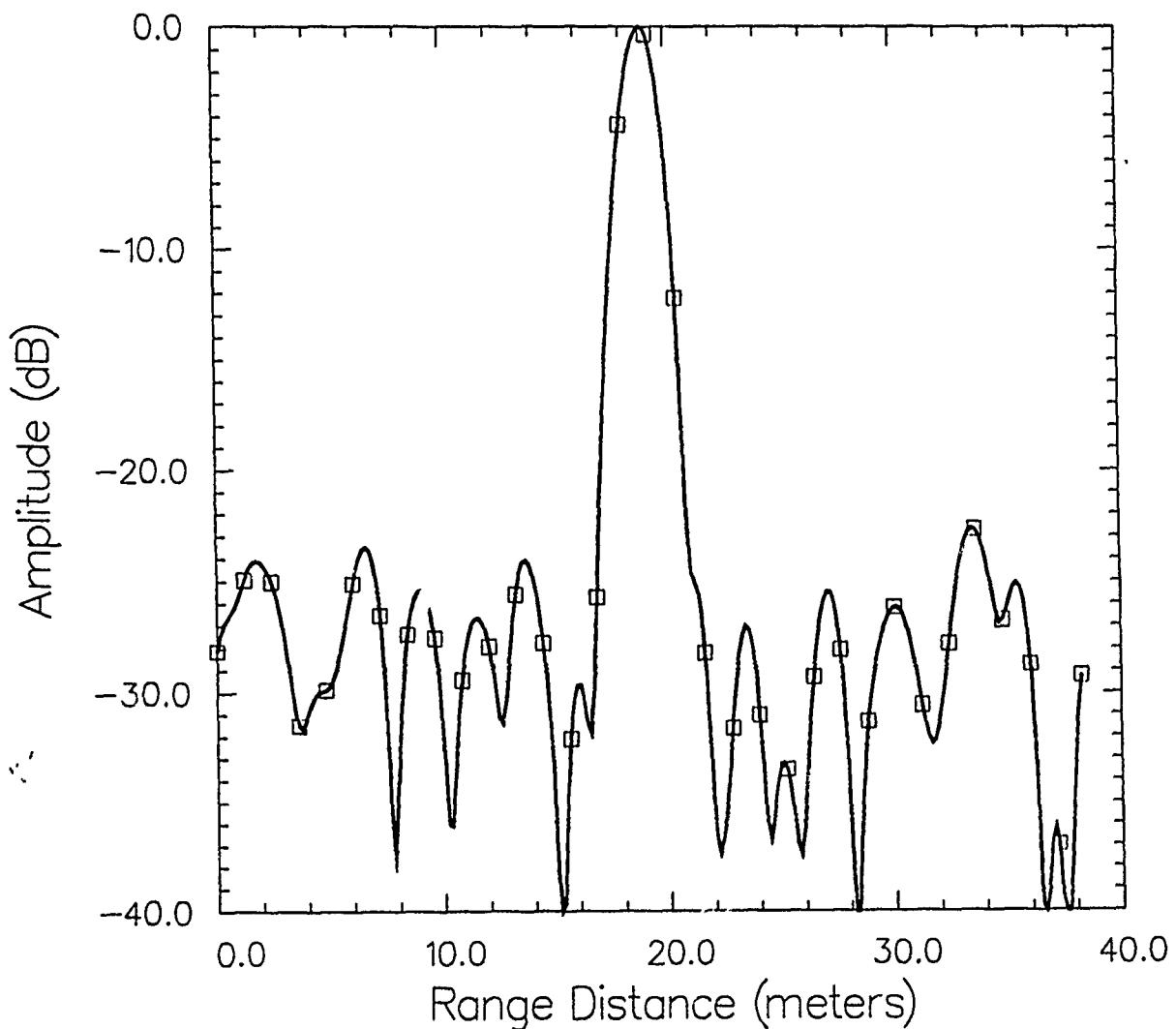


File: P3T1005.CI  
Rec: 2587.7500  
Elem: 2400.2500  
Azimuth 3dB width: 2.760m  
Range 3dB width: 1.546m  
Peak Amplitude: 1831.9  
Signal/Background: 21.43

Azimuth Spacing: 1.62m  
Range Spacing: 1.20m  
2D 3dB Energy:  $9.593 \times 10^6$   
2D Total Energy:  $3.545 \times 10^7$   
Comment: 3JUN90P36S

Figure 22. Impulse Response, Azimuth, C-VV Channel, Small Reflector

## Impulse Response, Range



File: P3T1005.CI  
Rec: 2587.7500  
Elem: 2400.2500  
Azimuth 3dB width: 2.760m  
Range 3dB width: 1.546m  
Peak Amplitude: 1831.9  
Signal/Background: 21.43

Azimuth Spacing: 1.62m  
Range Spacing: 1.20m  
2D 3dB Energy:  $9.593 \times 10^6$   
2D Total Energy:  $3.545 \times 10^7$   
Comment: 3JUN90P36S

Figure 23. Impulse Response, Range, C-VV Channel, Small Reflector

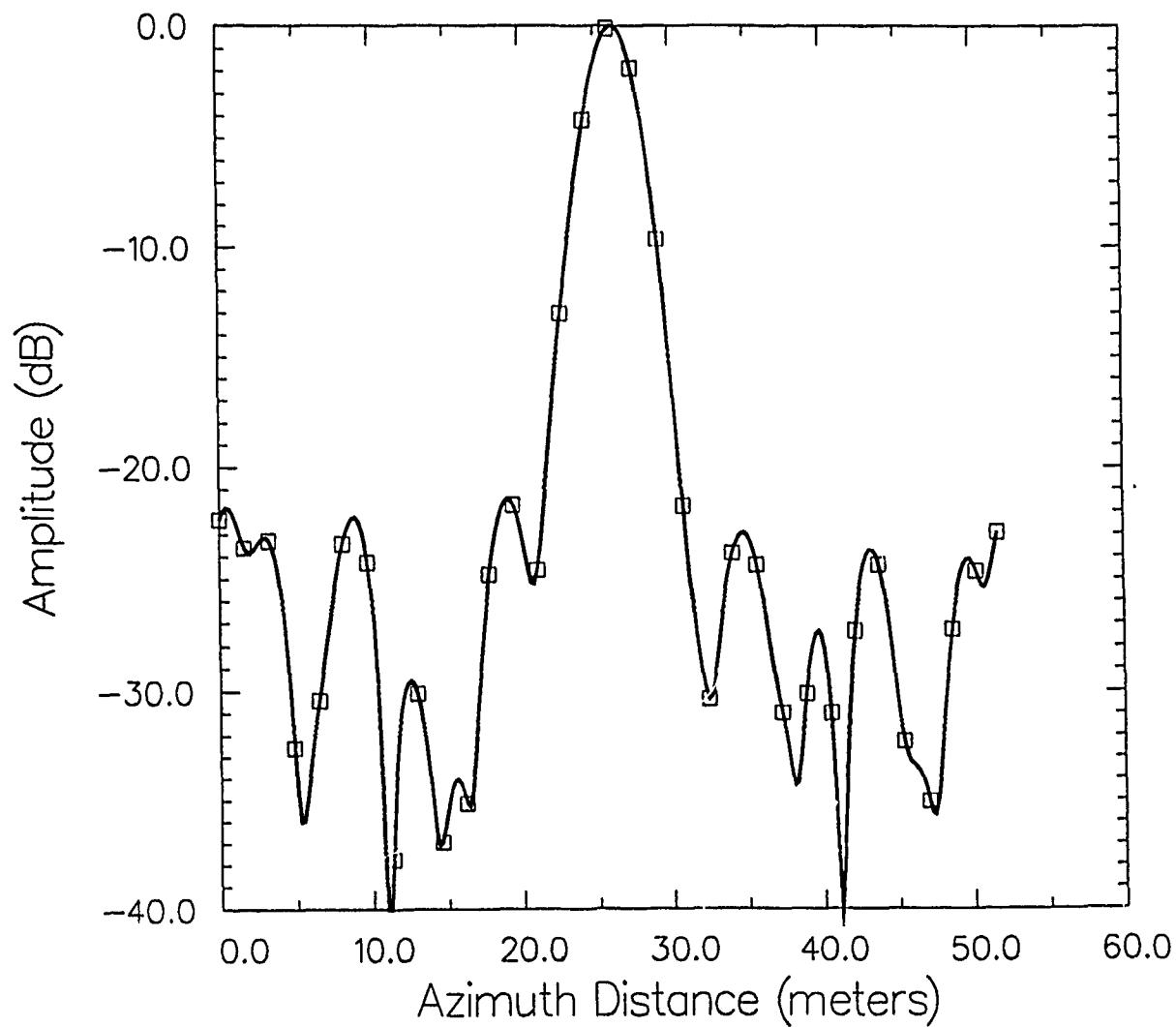
ARIES\$DRA2:[RSI:\v NERIS]\P3T1006.IPR;2  
 Environmental Research Institute of Michigan  
 Impulse Response Analysis Session Log  
 Executed 22-AUG-90 at 14:44:51.

22-AUG-1990 14:50

Filename	Peak	Rec	Peak	Elm	AzSpa	RgSpa	Az3dB	Rg3dB	Energy3dB	EnerTotal	Peak	Sig/Back	Comment
P3T1006.CI	2713	625	2258	.625	1.620	1.200	3.471	1.959	.15915E+07	.33544E+07	599.	37.91	90.43
P3T10C6.CI	2699	750	2276	.875	1.620	1.200	3.454	1.926	.16580E+07	.33465E+07	613.	38.10	90.02
P3T1006.CI	2682	125	2294	.500	1.620	1.200	3.450	1.929	.15808E+07	.29998E+07	598.	37.89	90.01
P3T1006.CI	2672	125	2316	.875	1.620	1.200	3.484	1.930	.82963E+06	.16430E+07	433.	35.08	75.02
P3T1006.CI	2663	500	2334	.625	1.620	1.200	3.357	1.967	.10378E+07	.24937E+07	486.	36.09	75.03
P3T1006.CI	2654	000	2351	.125	1.620	1.200	3.360	1.948	.11215E+07	.39335E+07	505.	36.42	75.01
P3T1006.CI	2638	500	2360	.250	1.620	1.200	3.367	1.974	.47944E+06	.32985E+07	330.	32.71	60.08
P3T1006.CI	2626	875	2366	.625	1.620	1.200	3.347	1.948	.48202E+06	.26539E+07	332.	32.77	60.20
P3T1006.CI	2619	.500	2373	.125	1.620	1.200	3.465	1.958	.48484E+06	.20031E+07	330.	32.73	60.13
P3T1006.CI	2627	.000	2410	.750	1.620	1.200	3.309	1.694	.32134E+06	.53856E+07	294.	31.73	45.01
P3T1006.CI	2599	.375	2382	.250	1.620	1.200	3.271	1.995	.11355E+06	.46246E+06	161.	26.46	45.02
P3T1006.CI	2601	.375	2412	.375	1.620	1.200	4.608	1.732	.19304E+06	.42816E+07	196.	28.18	45.03

Figure 24. Impulse Response Listing for L-HH

## Impulse Response, Azimuth

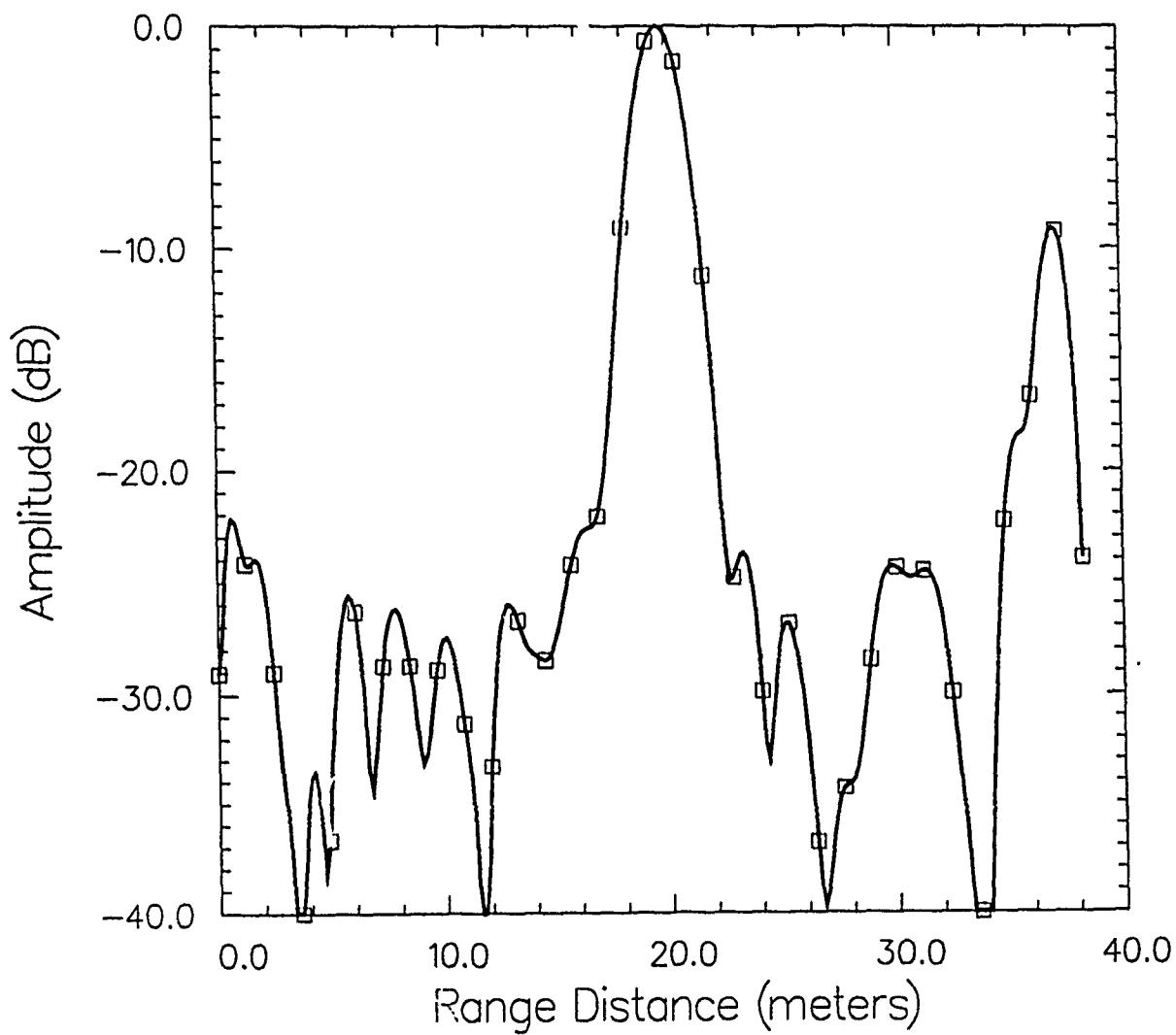


File: P3T1006.CI  
Rec: 2599.3750  
Elem: 2382.2500  
Azimuth 3dB width: 3.271m  
Range 3dB width: 1.995m  
Peak Amplitude: 160.5  
Signal/Background: 18.03

Azimuth Spacing: 1.62m  
Range Spacing: 1.20m  
2D 3dB Energy:  $1.135 \times 10^5$   
2D Total Energy:  $4.625 \times 10^5$   
Comment: 3JUN90P36S

Figure 25. Impulse Response, Azimuth, L-VV Channel, Large Reflector

## Impulse Response, Range

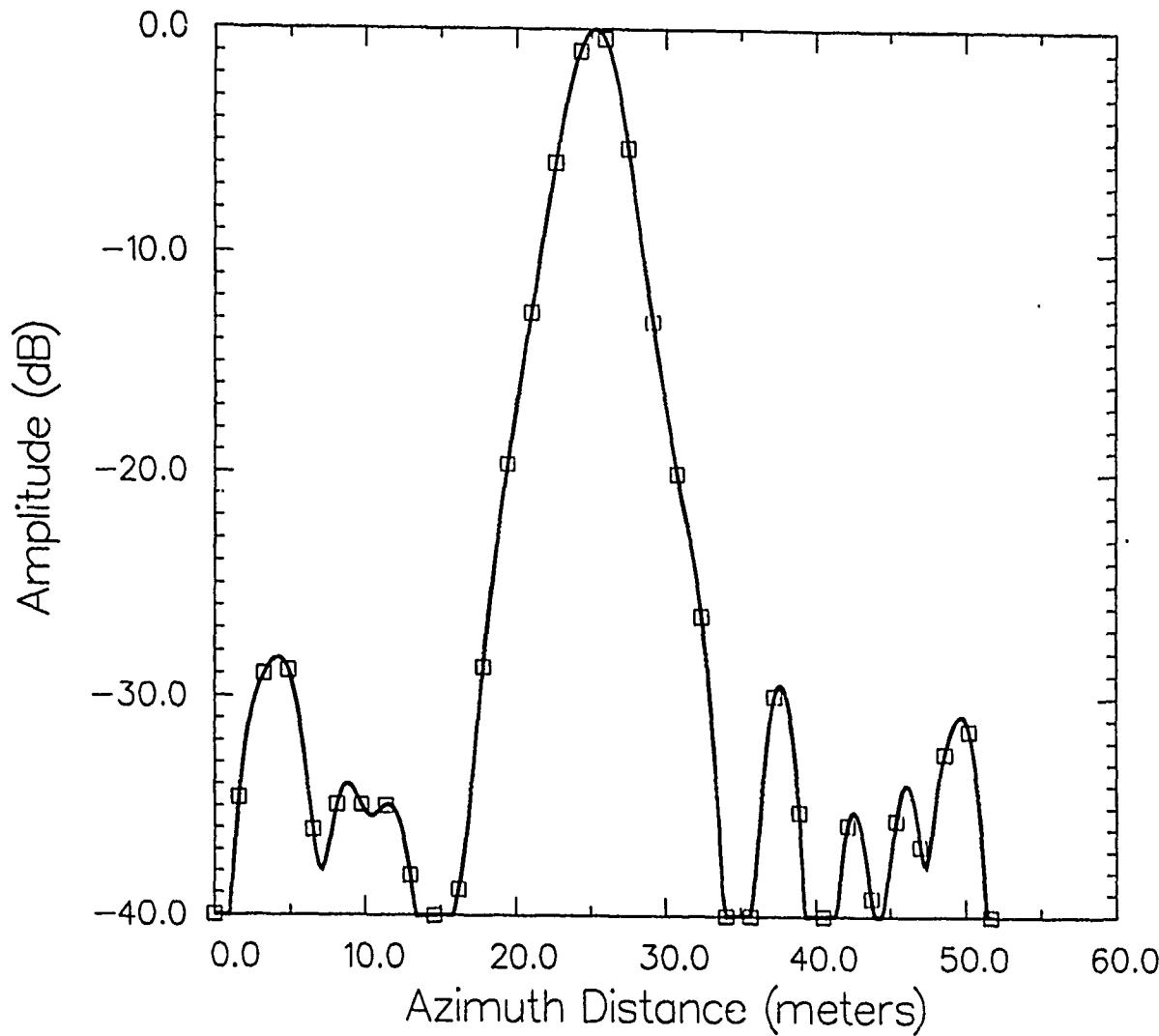


File: P3T1006.CI  
Rec: 2599.3750  
Elem: 2382.2500  
Azimuth 3dB width: 3.271m  
Range 3dB width: 1.995m  
Peak Amplitude: 160.5  
Signal/Background: 18.03

Azimuth Spacing: 1.62m  
Range Spacing: 1.20m  
2D 3dB Energy:  $1.135 \times 10^5$   
2D Total Energy:  $4.625 \times 10^5$   
Comment: 3JUN90P36S

Figure 26. Impulse Response, Range, L-VV Channel, Large Reflector

## Impulse Response, Azimuth

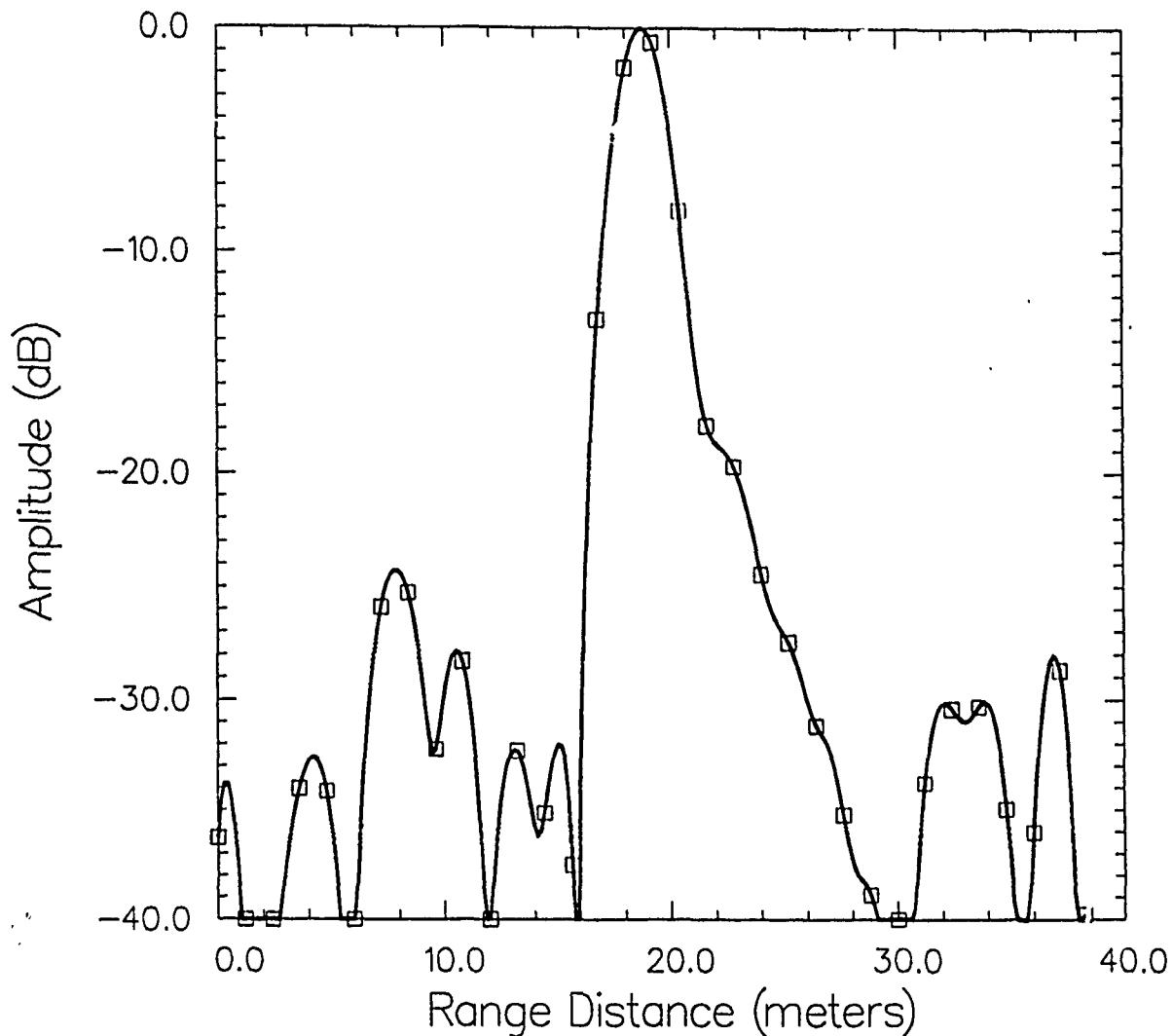


File: P3T1006.CI  
Rec: 2713.6250  
Elem: 2258.6250  
Azimuth 3dB width: 3.471m  
Range 3dB width: 1.959m  
Peak Amplitude: 599.5  
Signal/Background: 67.36

Azimuth Spacing: 1.62m  
Range Spacing: 1.20m  
2D 3dB Energy:  $1.592 \times 10^6$   
2D Total Energy:  $3.354 \times 10^5$   
Comment: 3JUN90P36L

Figure 27. Impulse Response, Azimuth, L-VV Channel, Small Reflector

## Impulse Response, Range



File: P3T1006.CI  
Rec: 2713.6250  
Elem: 2258.6250  
Azimuth 3dB width: 3.471m  
Range 3dB width: 1.959m  
Peak Amplitude: 599.5  
Signal/Background: 67.36

Azimuth Spacing: 1.62m  
Range Spacing: 1.20m  
2D 3dB Energy:  $1.592 \times 10^6$   
2D Total Energy:  $3.354 \times 10^6$   
Comment: 3JUN90P36L

Figure 28. Impulse Response, Range, L-VV Channel, Small Reflector

X-VV

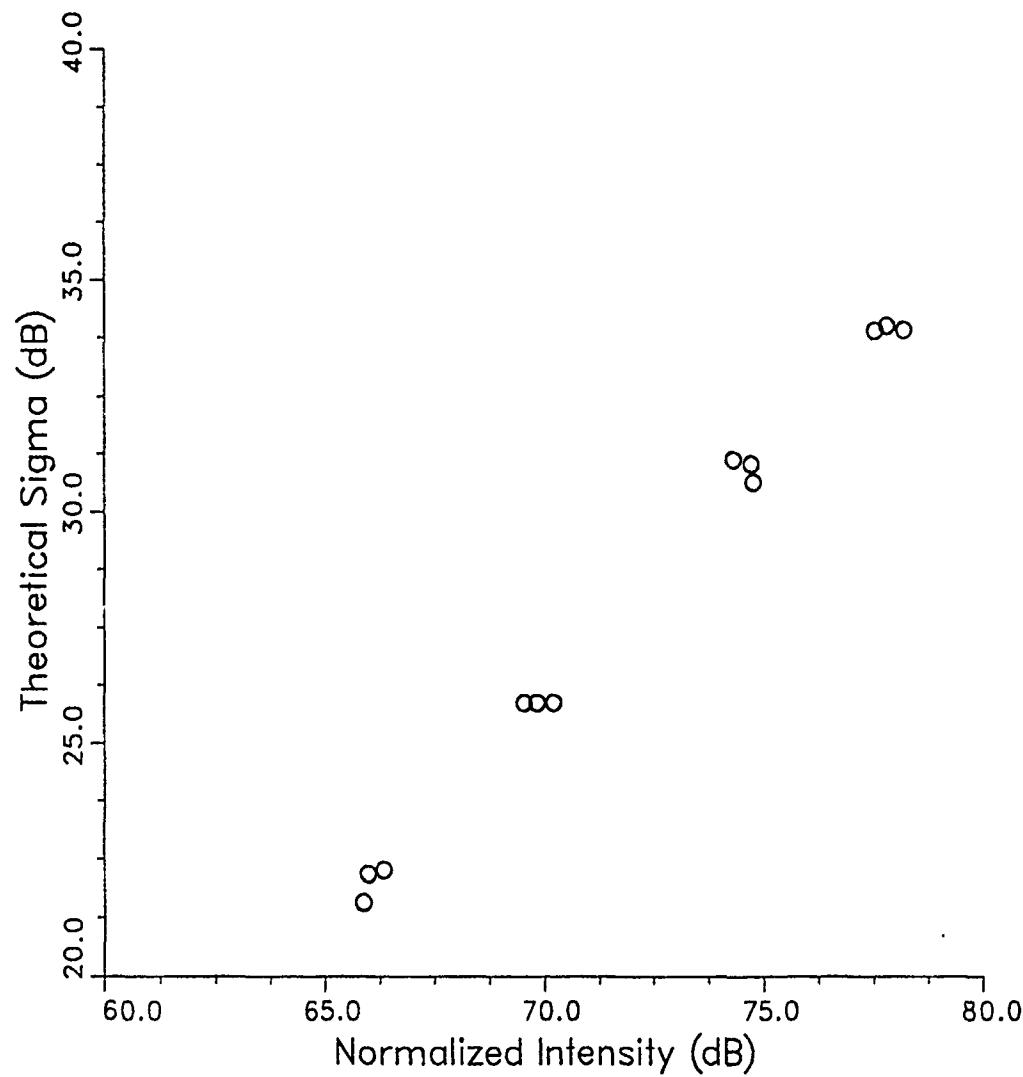


Figure 29. Normalized Intensity L-VV (Measured) Versus Theoretical RCS

REFL	PREC	AZ3DB	PG3DB	EIGD8	TOTENG	ATTN	XPOW	BRC	RNGT	INC<	BRCK	SIGAB	SIGCB	NRTHAB	
90.03	2716.000	2.738	1.544	0.30968E+09	0.58191E+09	12.0	-32.5	25.0	5777.9	59.592	87.500	33.935	27.654	77.550	
90.02	2705.125	2.764	1.559	0.33112E+09	0.62388E+09	12.0	-32.5	25.0	5761.2	59.846	87.500	34.022	27.678	77.519	
90.01	2684.500	2.741	1.566	0.36515E+09	0.69392E+09	12.0	-32.5	25.0	5710.1	59.774	87.500	33.930	27.603	78.212	
75.02	2674.500	2.726	1.571	0.15551E+09	0.31692E+09	12.0	-32.5	25.0	5732.1	59.704	87.500	31.135	24.818	74.330	
75.03	2665.875	2.743	1.564	0.11145E+09	0.41667E+09	12.0	-32.5	25.0	5717.7	59.643	87.500	31.019	24.714	74.731	
75.01	2656.375	2.729	1.574	0.17336E+09	0.59974E+09	12.0	-32.5	25.0	5706.3	59.576	87.500	30.613	24.313	74.722	
60.08	2645.875	2.743	1.590	0.52438E+08	0.40465E+08	12.0	-32.5	25.0	5687.7	59.466	87.500	25.269	19.473	69.546	
60.20	2629.250	2.718	1.585	0.33116E+08	0.28021E+09	12.0	-32.5	25.0	5673.8	59.383	87.500	25.874	19.531	69.837	
60.13	2622.875	2.755	1.577	0.61591E+08	0.25319E+08	12.0	-32.5	25.0	5664.9	59.330	87.500	25.277	19.498	70.239	
45.01	2616.250	2.807	1.571	0.25319E+08	0.23088E+09	12.0	-32.5	25.0	5658.1	59.289	87.500	22.262	15.809	66.339	
45.02	2601.750	2.770	1.577	0.23655E+08	0.10933E+09	12.0	-32.5	25.0	5660.8	59.184	87.500	21.568	15.181	65.933	
45.03	2588.500	2.751	1.583	0.24353E+08	0.66246E+08	12.0	-32.5	25.0	5624.9	59.087	87.500	22.174	15.784	65.933	
ORIGINAL SLOPE = 1.019															
ORIG Y-INTERCEPT = -45.273															
ORIG MSE = 0.119															
MOD Y-INTERCEPT = -43.909															
MOD MSE = 0.116															
HOD RMSE = 0.340															
PROCESSING SCALE FACTOR RES SCALE FACTOR															
-0.830 0.000															
TAPE DATE PA MEAN THETA MEAN RANGE RES ATTE TRANS PHR MAX SCR MIN SCR AVG SCR															
S7:P3TR003.. 030690 36 59.527 5698.4 12.0 -32.5 11118.94 709.69 4441.03															

**Figure 30.** Computer Listing with the Calculation of the Slope of the Least-Squares Fitted Line for the Theoretical RCS (sigma in dB) Versus the Normalized 3 dB Energy (in dB) of the Trihedral Corner Reflectors for the X-VW Channel

L-VV

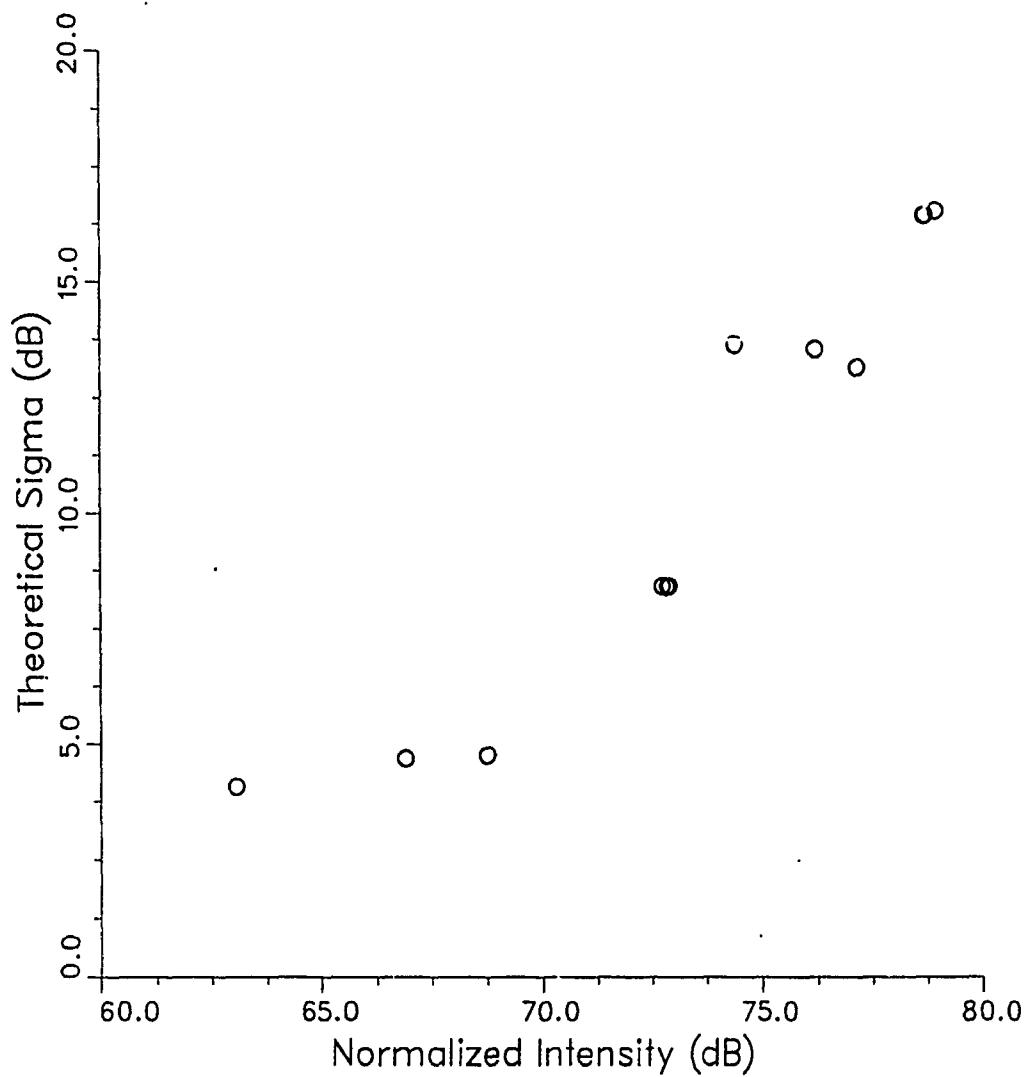


Figure 31. Normalized Intensity L-VV (Measured) Versus Theoretical RCS



P31- s7:p3t1004f		AZSPA: 1.620		RGSPA: 1.200		TD: 16.799		ALT:M: 2889 65		STRG: 2519.85		SIGDB		SIG03B		NOREN34B	
REFL	PKREC	A/3DB	RG3DB	ERG3DB	TOTENG	ATTN	XFOV	BOR<	RHPT	INC<	BACK	SIGDB	SIG03B				
90.03	2713.500	3.356	1.920	0.17678E-07	0.33996E+07	38.0	-30.4	25.0	2774.9	59.975	9.380	16.416	8.325	78.742			
90.02	2699.625	1.926	0.18111E-07	0.36486E+07	38.0	-30.4	25.0	2578.0	59.879	9.380	16.523	8.317	79.016				
90.01	2682.000	3.342	1.874	0.18502E-07	0.34315E+07	38.0	-30.4	25.0	2373.1	59.775	9.380	16.432	8.464	78.776			
75.02	2672.000	3.360	1.936	0.15646E-06	0.25528E+07	38.0	-30.4	25.0	5725.1	59.675	9.380	16.644	5.526	74.436			
75.03	2663.375	3.342	1.933	0.10164E-07	0.27890E+07	38.0	-30.4	25.0	5714.7	59.625	9.380	13.636	5.526	74.436			
75.01	2654.000	3.288	1.924	0.12115E-07	0.13134E+07	38.0	-30.4	25.0	5703.5	59.559	9.380	13.540	5.138	76.248			
60.08	2638.375	3.246	1.938	0.47130E-06	0.22101E+07	38.0	-30.4	25.0	5684.7	59.448	9.380	8.407	0.442	72.862			
60.09	2621.500	3.268	1.926	0.46193E-06	0.27458E+07	38.0	-30.4	25.0	5670.8	59.365	9.380	8.412	0.448	72.753			
60.13	2619.250	3.334	1.935	0.18109E-06	0.20754E+07	38.0	-30.4	25.0	5661.8	59.311	9.380	8.415	0.319	72.916			

Figure 32. Computer Listing with the Calculation of the Slope of the Least-Squares Fitted Line for the Theoretical RCS ( $\sigma$ , in dB) Versus the Normalized 3 dB Energy (in dB) of the Trihedral Corner Reflectors for the L-W Channel

## C-VV

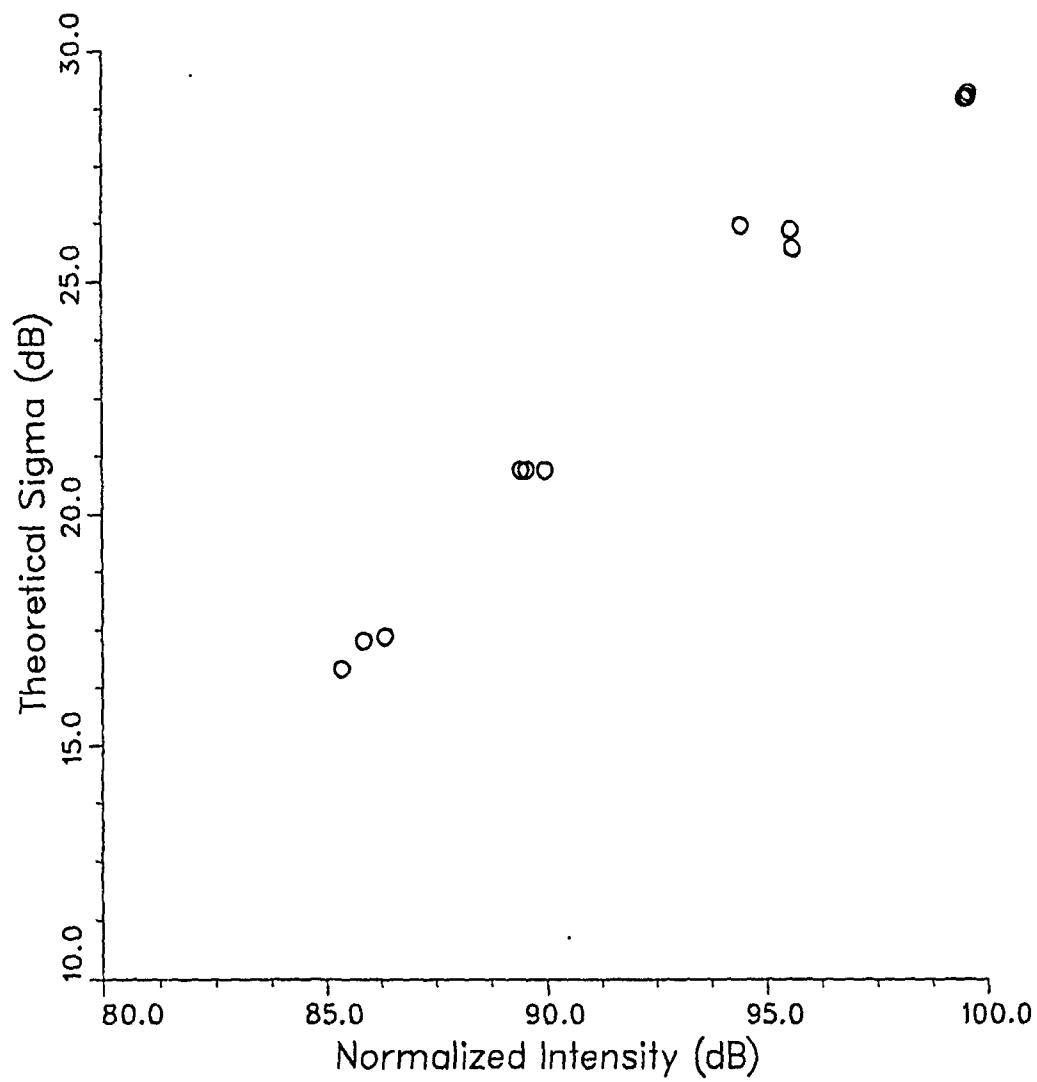


Figure 33. Normalized Intensity C-VV (Measured) Versus Theoretical RCS

PJ#:	S7:P3T1005.t	AZSPX:	1.620	RGSPPX:	1.200	TD:	16.799	WTH:	2689.65	STRG:	2519.85			
REFL	PRREC	AZ3DB	RGS3DB	EN:G3DB		TOTENG	ATTN	XPOW	BORK	RNGPT	INC<	BACK	SIGdB	ROKED:dB
90.33	2715.250	2.744	1.564	0.12456E+09	0.222614E+09	23.0	-18.4	25.0	5777.0	59.987	58.200	29.015	22.689	99.544
90.32	2701.375	2.797	1.541	0.12226E+09	0.23633E+09	23.0	-18.4	25.0	5760.3	59.891	58.200	29.122	22.777	99.614
90.31	2683.625	2.781	1.544	0.12343E+09	0.23555E+09	23.0	-18.4	25.0	5739.0	59.767	58.200	29.031	22.702	99.620
75.32	2673.750	2.770	1.546	0.11424E+08	0.10534E+08	23.0	-18.4	25.0	5727.1	59.998	58.200	29.235	19.219	99.171
75.33	2665.125	2.723	1.558	0.66819E+08	0.14029E+09	23.0	-18.4	25.0	5716.8	59.633	58.200	29.139	19.163	95.595
75.31	2655.625	2.784	1.569	0.67322E+08	0.24669E+09	23.0	-18.4	25.0	5705.4	59.571	58.200	29.744	19.341	95.648
60.38	2640.125	2.737	1.567	0.10624E+08	0.12095E+09	23.0	-18.4	25.0	5686.8	59.460	58.200	20.958	14.635	89.997
60.20	2628.500	2.709	1.583	0.16595E+08	0.10399E+09	23.0	-18.4	25.0	5672.9	59.377	58.200	20.964	14.641	89.454
60.13	2622.000	2.750	1.574	0.17041E+08	0.85466E+08	23.0	-18.4	25.0	5663.9	59.323	58.200	20.967	14.604	89.577
45.01	2615.500	2.801	1.568	0.11616E+07	0.78938E+08	23.0	-18.4	25.0	5657.3	59.884	58.200	14.362	10.395	86.356
45.02	2601.000	2.841	1.543	0.85103E+07	0.39761E+08	23.0	-18.4	25.0	5639.9	59.179	58.200	16.668	10.550	83.365
45.03	2587.750	2.760	1.546	0.95923E+07	0.35451E+08	23.0	-18.4	25.0	5624.0	59.082	58.200	17.274	10.473	85.861
ORIGINAL SLOPE = 0.871														
ORIG Y-INTERCPT = -57.321														
ORIG MSE = 0.280														
MOD Y-INTERCPT = -69.304														
MOD MSE = 0.759														
MOD RMSE = 0.871														
PROCESSING SCALE FACTOR		DATE	PA	MEAN THETA	MEAN RANGE	RES ATTE	TRANS PWR	MAX SCR	MIN SCR	AVG SCR				
S7:P3T1005.	030690	36	59.521	5697.5	23.0	-38.4	8830.92	547.58	3694.73					
PROCESSING SCALE FACTOR RES SCALE FACTOR 0.000														
• -0.830														

**Figure 34. Computer Listing with the Calculation of the Slope of the Least-Squares Fitted Line for the Theoretical RCS (sigma in dB) Versus the Normalized 3 dB Energy (in dB) of the Trihedral Corner Reflectors for the C-WV Channel**

L-HH

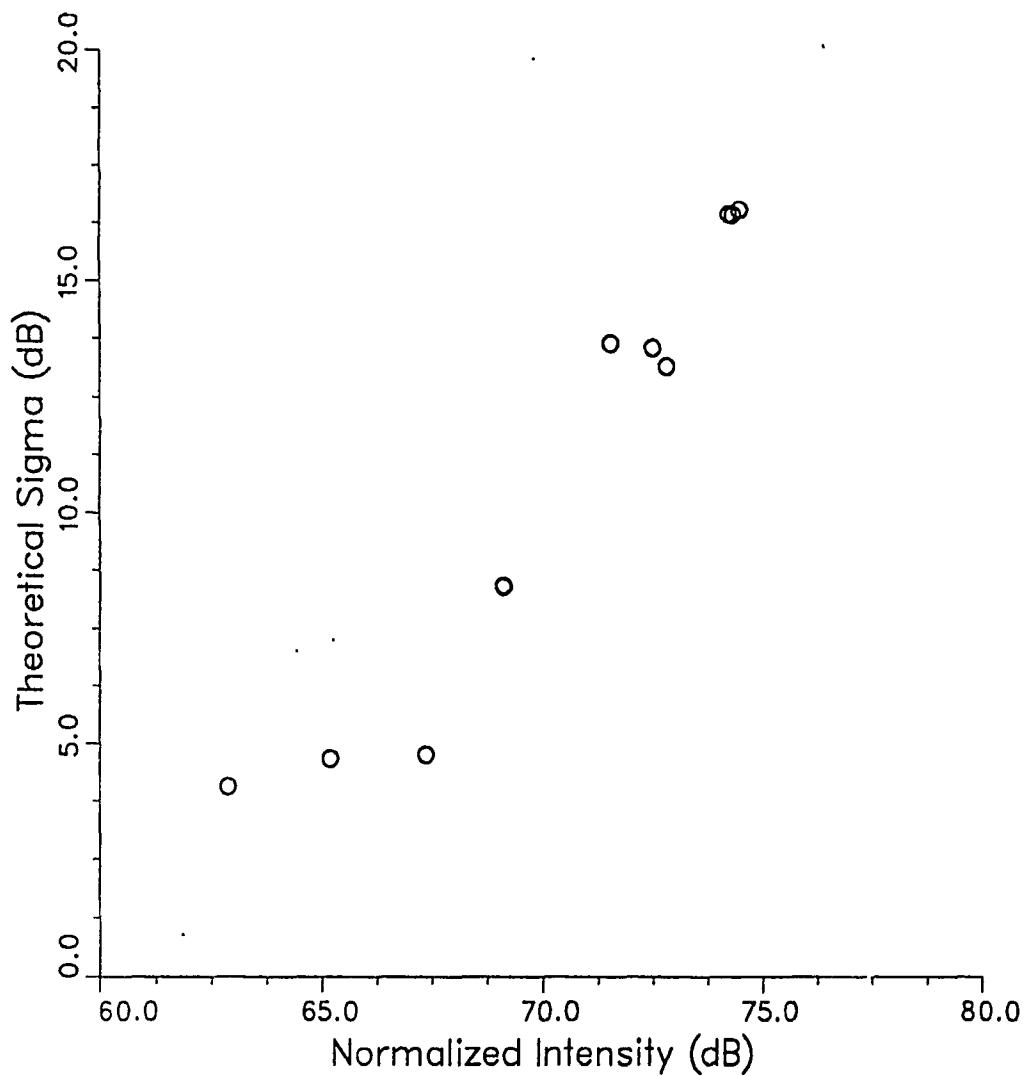


Figure 35. Normalized Intensity L-HH (Measured) Versus Theoretical RCS

P34: S7:P371006.t										P35A: 1 200 TD: 16.7E9 ALTN: 2889.0E5 SCR: 2519.85									
REFL	FREC	NEDB	R33C3	ENCL3DB	TOTENS	ATRN	XPOW	B05<	KHSPT	HRC<	BACH	SIG3B	SIG3D	NRCE3DB					
90.03	2713.625	3.471	1.959	0.15945E-07	0.33542E-07	33.0	-30.4	25.0	5775.0	59.975	7.630	16.416	8.091	74.366					
90.02	2699.750	3.454	1.929	0.16530E-07	0.33465E-07	33.0	-30.4	25.0	5758.4	59.880	7.630	16.532	8.263	74.316					
90.01	2682.125	3.450	1.929	0.15898E-07	0.29982E-07	33.0	-30.4	25.0	5737.2	59.757	7.630	16.431	8.200	74.280					
75.02	2672.125	3.484	1.930	0.82943E-06	0.16430E-07	33.0	-30.4	25.0	5725.2	59.687	7.630	13.636	5.361	71.559					
75.03	2663.500	3.357	1.957	0.10318E-07	0.24937E-07	33.0	-30.4	25.0	5714.9	59.626	7.630	13.540	5.343	72.516					
75.02	2654.000	3.360	1.958	0.11235E-07	0.32395E-07	33.0	-30.4	25.0	5703.5	59.559	7.630	13.145	5.985	72.536					
60.08	2638.500	3.367	1.974	0.47944E-06	0.32985E-07	33.0	-30.4	25.0	59.449	7.630	3.407	0.181	6.9115						
60.20	2626.875	3.347	1.948	0.48222E-06	0.26599E-07	33.0	-30.4	25.0	5670.9	59.366	7.630	8.412	0.270	6.9117					
60.13	2619.500	3.465	1.958	0.48444E-06	0.20031E-07	33.0	-30.4	25.0	5662.1	59.313	7.630	2.415	0.160	6.9129					
45.01	2627.000	3.309	1.694	0.32234E-06	0.53856E-07	33.0	-30.4	25.0	5671.1	59.367	7.630	4.757	-2.729	67.555					
45.02	2599.375	3.271	1.955	0.11335E-06	0.46246E-06	33.0	-30.4	25.0	5637.9	59.167	7.630	4.069	-4.077	62.575					
45.03	2601.375	4.608	1.732	0.19304E-06	0.42816E-07	33.0	-30.4	25.0	5640.3	59.181	7.630	4.668	-4.352	65.188					
ORIGINAL SLOPE										-75.321									
ORIG Y-INTERCEPT										-75.321									
WOD Y-INTERCEPT										-59.536									
HOD MSE										2.325									
HOD RMSE										1.528									

TAPE	DATE	PA	MEAN THETA	MEAN RANGE	RES ATTE	TRANS P-R	MAX SCR	MIN SCR	AVG SCR
S7:P371006.	030690	36	59.527	5698.4	33.0	-30.4	4281.11	29e.89	2131.62
PROCESSING SCALE FACTOR									
RES SCALE FACTOR									
-0.830					0.000				

**Figure 36.** Computer Listing with the Calculation of the Slope of the Least-Squares Fitted Line for the Theoretical RCS (sigma in dB) Versus the Normalized 3 dB Energy (in dB) of the Trihedral Corner Reflectors for the L-VV Channel

Table 1.

AUTEC Calibration Array  
26 May '90 Pass 2

Filename	Peak_Rec	Peak_Elm	AzSpa	RgSpa	Az3dB	Rg3dB	Energy3dB	EnerTotal	Peak	Sig/Back	Comment
P3T960.CI	2231.625	2046.625	1.620	1.200	3.667	1.673	9.831E+06	4.269E+07	1588.	N/A	X-W Large
P3T960.CI	2146.000	2118.625	1.620	1.200	3.709	1.740	1.156E+06	6.781E+06	540.	N/A	X-W Small
P3T961.CI	2229.000	2046.375	1.620	1.200	5.893	1.732	2.224E+06	8.495E+06	593.	29.65	L-W Large
P3T961.CI	2143.250	2118.250	1.620	1.200	5.027	1.846	8.350E+04	8.975E+05	114.	5.72	L-W Small
P3T962.CI	2230.875	2046.375	1.620	1.200	2.796	1.625	7.466E+06	3.079E+07	1600.	N/A	C-W Large
P3T962.CI	2145.250	2118.500	1.620	1.200	2.822	1.627	3.463E+05	2.513E+06	344.	N/A	C-W Small
P3T963.CI	2229.000	2046.375	1.620	1.200	4.630	1.680	5.713E+05	2.026E+06	334.	60.72	L-HH Large
P3T963.CI	2143.375	2118.250	1.620	1.200	4.620	1.752	4.339E+04	2.271E+05	92.	16.71	L-HH Small

Table 2.

AUTEC Calibration Array  
28 May '90 Pass1

Filename	Peak Rec	Peak Elm	AzSpa	RgSpa	Az3dB	Rg3dB	Energy3dB	EnerTotal	Peak	Sig/Back	Comment
P3T965.CI	2433.625	2121.875	1.620	1.200	2.805	1.533	1.700E+07	8.697E+07	2446.	33.51	X-W Large
P3T965.CI	2347.000	2195.875	1.620	1.200	2.671	1.559	3.330E+06	2.192E+07	1088.	14.90	X-W Small
P3T966.CI	2431.125	2122.250	1.620	1.200	4.935	1.941	4.389E+06	1.798E+07	821.	17.85	L-W Large
P3T966.CI	2344.875	2196.375	1.620	1.200	4.388	2.086	1.349E+05	4.217E+06	151.2	3.29	L-W Small
P3T967.CI	2432.750	2122.625	1.620	1.200	2.841	1.602	1.132E+08	3.819E+08	5960.	60.82	C-W Large
P3T967.CI	2346.250	2196.500	1.620	1.200	2.839	1.539	6.041E+06	3.601E+07	1388.	14.16	C-W Small
P3T968.CI	2431.250	2122.625	1.620	1.200	4.400	1.873	2.779E+06	1.438E+07	711.	20.32	L-HH Large
P3T968.CI	2344.875	2196.750	1.620	1.200	4.031	1.833	2.291E+05	4.387E+05	217.	6.19	L-HH Small

AUTEC Calibration Array  
28 May '90 Pass 31

Table 3.

Filename	Peak Rec	Peak Elm	AzSpa	RgSpa	Az3dB	Rg3dB	Energy3dB	EnerTotal	Peak	Sig/Back	Comment
P3T976.CI	2763.500	2047.875	1.620	1.200	2.733	1.816	.10658E+07	.50095E+07	564.	30.50	X-W Large
P3T976.CI	2675.250	2123.125	1.620	1.200	2.630	1.675	.12200E+06	.11869E+07	206.	11.12	X-W Small
P3T977.CI	2760.750	2048.250	1.620	1.200	3.352	1.997	.17670E+06	.74900E+06	632.	25.28	L-W Large
P3T977.CI	2672.875	2123.250	1.620	1.200	3.783	2.098	.13420E+05	.15080E+06	164.	6.55	L-W Small
P3T978.CI	2762.500	2048.000	1.620	1.200	2.755	1.583	.61724E+08	.23534E+09	4633.	77.22	C-W Large
P3T978.CI	2674.250	2123.125	1.620	1.200	2.802	1.570	.42295E+07	.20897E+08	1211.	20.18	C-W Small
P3T979.CI	2760.750	2048.125	1.620	1.200	3.475	2.017	.24613E+07	.93081E+07	740.	46.26	L-HH Large
P3T979.CI	2664.250	2128.500	1.620	1.200	3.631	1.889	.34702.	.13521E+07	88.	5.51	L-HH Small

**Table 4.**

**AUTEC Calibration Array**  
**31 May '90 Pass 24**

Filename	Peak_Rec	Peak_Elm	AzSpa	RgSpa	Az3dB	Rg3dB	Energy3dB	EnerTotal	Peak	Sig/Back	Comment
P3T981.CI	2512.625	2360.875	1.620	1.200	2.700	1.785	8.518E+06	3.670E+07	1698.	65.31	X-W Large
P3T981.CI	2426.125	2434.375	1.620	1.200	2.800	1.635	7.954E+05	4.008E+06	523.	20.11	X-W Small
P3T982.CI	2510.000	2361.500	1.620	1.200	4.922	1.684	1.063E+06	3.803E+06	440.	N/A	L-W Large
P3T982.CI	2423.500	2434.750	1.620	1.200	6.355	1.708	4.238E+04	4.821E+05	77.6	N/A	L-W Small
P3T983.CI	2511.750	2361.250	1.620	1.200	2.793	1.530	5.058E+07	1.866E+08	4218.	N/A	C-W Large
P3T984.CI	2510.000	2361.500	1.620	1.200	4.935	1.643	6.066E+05	1.983E+06	334.	N/A	L-HH Large
P3T984.CI	2415.250	2440.250	1.620	1.200	6.366	1.569	6.577E+03	2.729E+05	32.	N/A	L-HH Small

Table 5.

AUTEC Calibration Array  
2 June '90 Pass 6

<u>Filename</u>	<u>Peak Rec</u>	<u>Peak Elm</u>	<u>AzSpa</u>	<u>RgSpa</u>	<u>Az3dB</u>	<u>Rg3dB</u>	<u>Energy3dB</u>	<u>EnerTotal</u>	<u>Peak</u>	<u>Sig/Back</u>	<u>Comment</u>
P3T991.CI	1994.125	2312.000	1.620	1.200	2.767	1.647	.24594E+09	.48439E+09	9180.	212.99	X-W Large
P3T991.CI	1881.000	2451.250	1.620	1.200	2.798	1.676	.14205E+08	.42385E+08	2195.	50.92	X-W Small
P3T992.CI	1991.500	2312.000	1.620	1.200	3.189	1.853	.13257E+07	.35146E+07	583.	45.32	L-W Large
P3T992.CI	1924.625	2411.500	1.620	1.200	3.157	1.812	.31157E+06	.30659E+07	284.	22.08	L-W Med.
P3T992.CI	1856.375	2454.875	1.620	1.200	3.454	1.831	.22640E+06	.86321E+07	229.	17.76	L-W Small
P3T993.CI	1993.375	2312.250	1.620	1.200	2.725	1.611	.80051E+08	.15252E+09	5268.	148.40	C-W Large
P3T993.CI	1880.250	2451.500	1.620	1.200	2.806	1.600	.52239E+07	.20411E+08	1341.	37.77	C-W Small

Table 6.

 AUTEC Calibration Array  
 3 June '90 Pass 2

<u>Filename</u>	<u>Peak Rec</u>	<u>Peak Elm</u>	<u>AzSpa</u>	<u>RgSpa</u>	<u>Az3dB</u>	<u>Rg3dB</u>	<u>Energy3dB</u>	<u>EnerTotal</u>	<u>Peak</u>	<u>Sig/Back</u>	<u>Comment</u>
P3T997.CI	1596.625	2840.750	1.620	1.200	2.639	1.846	.86909E+06	.50780E+07	518.	17.87	X-W Large
P3T997.CI	1515.625	2952.000	1.620	1.200	2.838	1.428	.25780E+06	.28729E+07	309.	10.66	X-W Small
P3T998.CI	1593.875	2841.250	1.620	1.200	3.416	1.719	.13625E+07	.39180E+07	599.	29.96	L-W Large
P3T998.CI	1513.125	2952.125	1.620	1.200	2.918	1.730	.13320E+06	.14806E+07	201.	10.03	L-W Small
P3T999.CI	1595.875	2841.375	1.620	1.200	2.722	1.574	.36715E+08	.70812E+08	3586.	59.77	C-W Large
P3T999.CI	1515.125	2952.250	1.620	1.200	2.813	1.579	.60773E+07	.32192E+08	1449.	24.16	C-W Small
P3T1000.CI	1593.750	2841.000	1.620	1.200	3.834	1.592	.64868E+06	.38780E+07	398.	13.28	L-H Large
P3T1000.CI	1512.875	2952.000	1.620	1.200	3.304	1.428	.10092E+06	.30827E+06	181.	6.02	L-H Small

Table 7.

 AUTEC Calibration Array  
 3 June '90 Pass 36

<u>Filename</u>	<u>Peak Rec</u>	<u>Peak Elm</u>	<u>AzSpa</u>	<u>RgSpa</u>	<u>Az3dB</u>	<u>Rg3dB</u>	<u>Energy3dB</u>	<u>EnerTotal</u>	<u>Peak</u>	<u>Sig/Back</u>	<u>Comment</u>
P3T1003.CI	2716.000	2258.500	1.620	1.200	2.738	1.544	.30969E+09	.58191E+09	10450.	92.48	X-W Large
P3T1003.CI	2588.500	2399.875	1.620	1.200	2.751	1.583	.24353E+08	.66246E+08	2911.	25.76	X-W Small
P3T1004.CI	2713.500	2258.625	1.620	1.200	3.356	1.920	.17678E+07	.33996E+07	637.	45.50	L-VV Large
P3T1004.CI	2599.375	2382.250	1.620	1.200	3.253	1.976	.50536.	.55816E+06	108.	7.68	L-W Small
P3T1005.CI	2715.250	2258.875	1.620	1.200	2.744	1.564	.12456E+09	.22814E+09	6598.	77.17	C-VV Large
P3T1005.CI	2587.750	2400.250	1.520	1.200	2.760	1.546	.95928E+07	.35451E+08	1832.	21.43	C-W Small
P3T1006.CI	2713.625	2258.625	1.620	1.200	3.471	1.959	.15915E+07	.33542E+07	599.	67.36	L-HH Large
P3T1006.CI	2599.375	2382.250	1.620	1.200	3.271	1.995	.11355E+06	.46246E+06	161.	18.03	L-HH Small

Table 8.

 AUTEC Calibration Array  
 4 June '90 Pass 35

<u>Filename</u>	<u>Peak Rec</u>	<u>Peak Elm</u>	<u>AzSpa</u>	<u>RgSpa</u>	<u>Az3dB</u>	<u>Rg3dB</u>	<u>Energy3dB</u>	<u>EnerTotal</u>	<u>Peak</u>	<u>Sig/Back</u>	<u>Comment</u>
P3T1008.CI	2460.875	2094.625	1.620	1.200	2.713	1.591	.17925E+09	.34743E+09	7921.	110.01	X-VV Large
P3T1008.CI	2339.438	2232.688	1.620	1.200	2.786	1.577	.10825E+08	.36852E+08	1941.	26.96	X-VV Small
P3T1009.CI	2462.500	2094.750	1.620	1.200	3.172	1.798	.12703E+07	.29733E+07	606.	37.87	L-WV Large
P3T1009.CI	2341.000	2232.250	1.620	1.200	6.549	1.780	.31122.	.65544E+06	66.	6.58	L-WV Small
P3T1010.CI	2460.750	2094.625	1.620	1.200	2.715	1.556	.12122E+09	.22170E+09	6533.	82.70	C-VV Large
P3T1010.CI	2339.313	2231.563	1.620	1.200	2.893	1.534	.79142E+07	.35019E+08	1587.	20.09	C-VV Small
P3T1011.CI	2463.250	2094.500	1.620	1.200	3.175	1.719	.10228E+07	.23239E+07	548.	54.77	L-HH Large
P3T1011.CI	2341.875	2232.000	1.620	1.200	6.627	1.612	.76676.	.15327E+06	105.	10.49	L-HH Small



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Table 9.

AUTEC Calibration Array  
5 June '90 Pass 1

Filename	Peak Rec	Peak Elm	AzSpa	RgSpa	Az3dB	Rg3dB	Energy3dB	EnerTotal	Peak	Sig/Back	Comment
P3T1014.CI	3037.125	2346.500	1.620	1.200	2.772	1.520	2.188E+07	4.940E+07	2783.	33.75	X-VV Large
P3T1014.CI	2907.250	2482.875	1.620	1.200	2.932	1.558	7.191E+05	3.985E+06	473.	12.36	X-VV Small
P3T1015.CI	3034.750	2346.250	1.620	1.200	5.579	1.661	1.206E+06	2.551E+06	451.	31.32	L-VV Large
P3T1015.CI	2918.500	2466.000	1.620	1.200	4.742	1.778	4.404E+04	3.730E+05	92.	17.52	L-VV Small
P3T1016.CI	3036.375	2346.750	1.620	1.200	2.830	1.549	9.134E+07	1.747E+08	5635.	36.57	C-VV Large
P3T1016.CI	2920.125	2466.000	1.620	1.200	2.821	1.549	8.090E+06	3.561E+07	1680.	26.06	C-VV Small
P3T1017.CI	3034.875	2346.375	1.620	1.200	5.740	1.717	9.024E+05	1.955E+06	376.	35.47	L-HH Large
P3T1017.CI	2918.625	2466.000	1.620	1.200	5.044	1.743	6.307E+04	3.189E+05	106.	24.47	L-HH Small

Table 10.

RS-90-124-1

AUTEC Calibration Array  
7 June '90 Pass 6

<u>Filename</u>	<u>Peak Rec</u>	<u>Peak Elm</u>	<u>AzSpa</u>	<u>RqSpa</u>	<u>Az3dB</u>	<u>Rq3dB</u>	<u>Energy3dB</u>	<u>EnerTotal</u>	<u>Peak</u>	<u>Sig/Back</u>	<u>Comment</u>
P3T1025.CI	2609.625	2174.625	1.620	1.200	2.747	1.532	.11160E+09	.21861E+09	6283.	35.97	X-W Large
P3T1025.CI	2482.375	2307.250	1.620	1.200	2.833	1.605	.22118E+08	.85927E+08	2760.	28.82	X-W Small
P3T1026.CI	2607.125	2174.500	1.620	1.200	3.243	1.831	.12617E+07	.24233E+07	552.	31.61	L-W Large
P3T1026.CI	2480.000	2308.000	1.620	1.200	4.436	1.627	.28631.	.14449E+07	79.	14.68	L-W Small
P3T1027.CI	2608.750	2174.875	1.620	1.200	2.706	1.496	.65696E+08	.13808E+09	5162.	34.71	C-W Large
P3T1027.CI	2481.625	2307.500	1.620	1.200	3.041	1.558	.78084E+07	.33652E+08	1558.	24.31	C-W Small
P3T1028.CI	2607.250	2174.625	1.620	1.200	3.182	1.896	.10005E+07	.20584E+07	504.	35.59	L-HH Large
P3T1028.CI	2480.000	2307.625	1.620	1.200	7.567	1.708	.61162.	.97940E+06	86.	20.23	L-HH Small